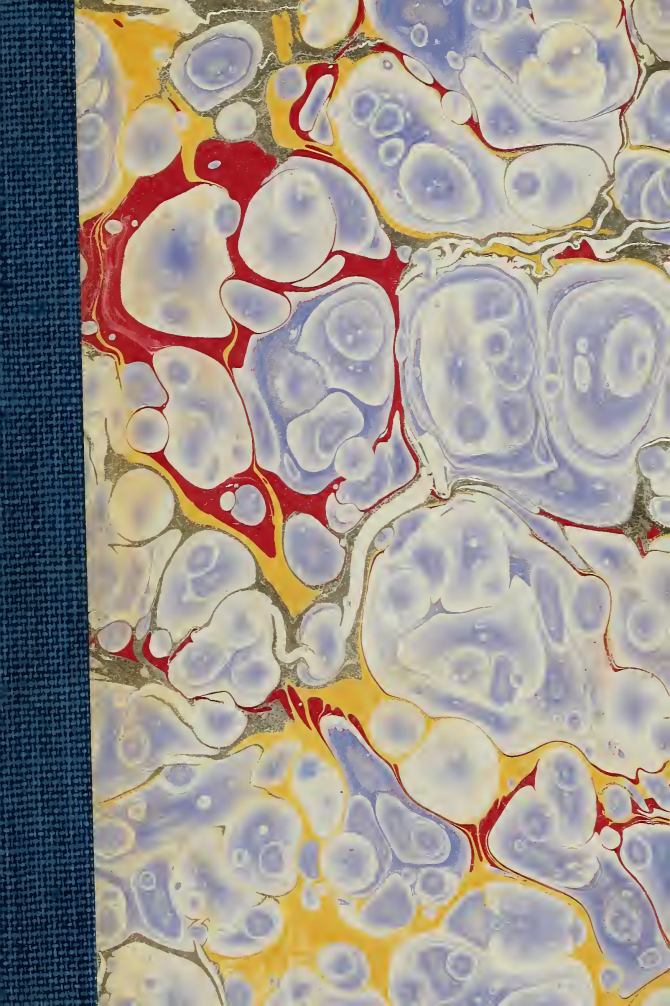

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A

TREATISE

ON THE

CAUSE AND CURE

OF THE

GOUT.

By JOHN CAVERHILL, M.D.

Member of the Royal College of Physicians.
F. R. S.

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AS

A TESTIMONY OF RESPECT,

TO ONE OF

THE BEST OF MEN,

THIS BOOK IS DEDICATED,

TO

ANDREW DOUGLAS, Esq.

BY

THE AUTHOR.

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ERRATA.

P. 43. for velocity, read *momentum*.
72. for γυναμου, read γυναικων.
85. for ſofter, read *diſtended*.

Directions to the Binder.

The firſt plate and explanation to be inſerted between the 10th and 11th pages.
The ſecond ditto between the 22d and 23d pages.
The third ditto between the 42 and 43.

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ON THE

GOUT.

CHAPTER I.

IT has been always imagined that the gout is occaſioned by ſome morbid matter circulating with the fluids, which, in proceſs of time, becomes ſo copious and ripe, that it muſt neceſſarily be depoſited in ſome particular part of the body.

The manner in which the paroxyſms were obſerved to terminate, appears to have eſtabliſhed this opinion, and made it ſo prevalent as it is; the diſeaſe being uſually carried off by a ſwelling of the part affected, or by cutaneous perſpiration. The gout, however, is univerſally allowed to be a family or hereditary diſeaſe; and this may be conſidered as the firſt fact which contradicts the received opinion: for hereditary diſeaſes can only proceed from a morbid texture, or form of the ſolids, ſince they are the moſt immutable parts of the body. Whereas the fluids, on the contrary, are frequently changed, and quickly renewed.

The ſolids have a power of continuing their form, by appropriating ſuch parts of the fluids as are moſt analogous to their own nature, while the remaining fluids are ſuffered to exhale, run off, or be expelled through the various emunctories of the body. If indeed the gouty matter did really circulate with the fluids, when the child was in embrio, and that no evacuation ever took place during the future growth of the body, ſuch matter muſt inevitably be retained, al-

though it would even then be difficult to conceive that it ſhould exiſt for thirty years in the ſame ſtate without any alteration. But when we reflect upon the rapid change, and perpetual renovation to which the fluids are ſubjected during infancy, we can hardly ſuppoſe that one drop of infant fluid, nervous, arterious, or venous, remains in the human body to its full growth.

If it be urged, that the arthritic matter, originally in the body, has power to aſſimulate, or even that the peculiar diſpoſition of the ſolids may tend to generate this matter, either of which circumſtances would keep up the exiſtence of it throughout life; to this I anſwer, that the veſſels are always in contact with the fluids, and are never in ſuch a ſtate of ſenſibility as when the body is young; and therefore if any noxious matter did really exiſt at that time, it muſt neceſſarily affect the acute ſenſation of the nerves of an infant.

Again: If the gout was produced by any acrimonious particles, circulating with the fluid, they would firſt irritate the moſt ſenſible parts of the body, ſuch as the brain, upper orifice of the ſtomach, wind-pipe, bladder, eyes, &c. and could ſcarcely ever be directed to thoſe which are endowed with a leſs degree of ſenſibility, ſuch as the bones, cartilages, ligaments, tendons, and membranes.

Laſtly: If this acrimony lay dormant in theſe inſenſible parts, until it acquired a ſufficient degree of virulence, or activity to make its appearance, the gout muſt then be allowed to be a local diſeaſe. But the inſtantaneous tranſition of the pains from one part of the body to another, is a proof of its univerſality, and totally deſtroys the ſuppoſition, that the ſecond pain proceeded from the ſame cauſe which excited the firſt.

Hence it appears, that the fluids have had qualities attributed to them in this diſeaſe of

which they can never be poſſeſſed; and that the gout therefore, like every other hereditary diſeaſe, muſt be owing to a preternatural ſtate of the ſolids.

CHAPTER II.

THE gout has been obſerved, in general, firſt to attack thoſe parts which are expoſed to the greateſt degree of compreſſion or motion, and conſequently falls, for the moſt part, on the joints; the conſtant motion therefore to which theſe parts are ſubjected, muſt neceſſarily produce ſome peculiar effect on the veſſels which ſurround them. I ſhall therefore endeavour to determine the nature of this effect, and to aſcertain the apparent difference in the ſtate of the veſſels diſtributed to the joints, and thoſe which are directed to the intermediate fleſhy parts.

All the muſcles of the body are in a ſtate of the greateſt ſtrength during their contraction. For no ſooner are the muſcles that bend a joint extended, than they are lengthened and weakened, in the ſame manner as a hair at a certain

point of extenſion. If a hair is held by its extremities between two hands, and elongated to the utmoſt ſtretch, it will evidently grow weaker the longer the extenſion is continued, and its diameter become ſmalleſt at the force acting upon it. Now the muſcles being endowed with the ſame contractility, appear evidently to be injured by extenſion in the ſame manner. For their tendons are ſmalleſt at their inſertions in the bone, or perioſteum, becauſe the force which acts upon them always takes place at theſe points, and from thence is continued towards the belly of the muſcle.

If a muſcle is extended, the blood-veſſels which ſupply it will be leſſened in their diameter, and their ſides yielding to the extending force, will come nearer to each other. But the ſides firſt give way at the point where the force is exerted, at which point the tubes will neceſſarily firſt collapſe; and, in extraordinary exertions, they will ſometimes have no cavity at all; for as the extenſion is continued, their internal ſides will at length be brought into contact, ſo that they will no longer remain pervious,

and the fluid, which would paſs through them, will be carried off by the collateral veſſels.

If theſe exertions are continual and violent, and the internal ſides of the veſſels are frequently brought into contact, they will probably cohere at ſome point or other in proceſs of time, and the veſſels will be converted into a membrane, at the part where this coheſion happens; but the remaining parts of the tube will continue pervious, while the circulation ſhall be carried on through it by means of the frequent anaſtamoſes or communications which nature has eſtabliſhed between the veſſels, to prevent the inconveniences that might ariſe from the obſtructions.

The ſame force that brought the internal ſides of the arteries together, would, at the ſame time, puſh, towards the belly of the muſcle, the oily fluid which lies between them and the fibres of the muſcles. This fluid is confined in a web of little cells, which communicate with each other, and ſurround every veſſel in the body. It prevents them from growing to one another, and preſerves them in a proper ſtate of

pliability. When the fluid, therefore, contained in theſe cells, is ſqueezed by extenſion from the extremity to the middle of the muſcle, the cells will collapſe and cohere to each other; and as their external ſides are already fixed to the neighbouring veſſels, ſo both the cells and the veſſels will be brought into a narrower compaſs. The extremity of the muſcle will then be harder and more ſolid; for it is deſtitute both of its blood and fat. It will likewiſe be diminiſhed in its diameter, for the fluids are known to conſtitute the greateſt bulk of the body.

Myriades enim vaſorum nunc cæce deſinunt alimentum partibus vicinis adfundere: deſinunt ergo eæ ali & ſenſim diſſipato undique fluido humore, in ſolidam maſſam, a longa contractione minorem abeunt; quæ iterum & vaſcula vicina comprimunt & cellulosa tela, eſt pro puncto fixo, ad quod tanquam ad punctum immobile, valentius ſe contrahant.

Hæc manifeſta cauſa eſt indurationis tendinum, ex pulpa carnea in durum ligamentum ex eo in cartilaginem tranſeuntium.——Illuſt. Hall. Vol. viii. l. xxx. ſect. 2.

As the blood-veſſels of a muſcle become firſt impervious at their inſertions in the perioſteum, ſo the ſame action that reduced them to that ſtate, if continued, will encreaſe their impermeability, and the muſcle muſt neceſſarily ſuffer, by elongation, a perpetual change from fleſh to tendon. This may be illuſtrated by the following repreſentation. *See plate I.*

Although the blood-veſſels of the muſcle become impervious in their extremities, yet the nerves which are ſpread upon their coats ſtill continue open, and allow their fluid to pervade the tendon. The tendon is indeed inſenſible; but that inſenſibility can only be owing to its hardneſs, and not to the want of permeability in its nerves. For the bones themſelves are the moſt inſenſible of all the parts of the body, and yet diſeaſes can ſo far relax the nerves, which are diſtributed to them, as to make them very ſuſceptible of pain. This evidently ſhows that the nerves only require a degree of ſoftneſs for the purpoſes of ſenſation, and that the want of ſenſibility in many parts of the body proceeds from the coheſions of the arteries. If the nerves

PLATE I.

SHEWS the muſcles of the bottom of the foot, from Cowper's Myotomia formata. Three of them are raiſed at one extremity, and turned aſide, that others, lying under them, might be expoſed.

The muſcle figured 1, 2, 3, may be obſerved to have three tendons inſerted in the three middle toes. Theſe tendons are joined together at ſome diſtance from the toes, gradually looſe their tendinous appearance, and become fleſh ; *for the tendons are* only continuations of *the ſame fibres of which the muſcles are compoſed.* Cheſſelden's Anatomy, p. 3.

As a muſcle is ſuffering a perpetual change from fleſh to tendon, the fleſh of this muſcle may be ſuppoſed to have once extended to 3, although it now ends at 1. All between 1 and 3, has therefore loſt its fleſhy nature, and is changed to tendon.

As the fibres of a muſcle approximate to form a tendon, the blood veſſels ſituated among them muſt neceſſarily be cloſed up at the ſame time. The blood-veſſels, therefore, between 1 and 3, are impervious ; and the blood, that uſually paſſed on to 3, is ſtopped at 1, and carried off by the collateral branches.

3
1
2
a
d
b
c
p

of theſe parts ſhould be obſtructed at the ſame time with the blood-veſſels, the fluids would ſoon be fixed in their tubes, which would then become a conſolidated fibre; and whenever this happened, the conſequences muſt neceſſarily be permanent, and the ſenſibility of the parts for ever loſt. But experience teſtifies, that diſeaſes can induce great irritability in parts which were before inſenſible, which could never be effected if their nerves had not retained their permeability.

It is conſtantly obſerved, that a muſcle becomes tendinous by motion; or, which is the ſame thing, that it grows leſs and leſs ſenſible. Now, if the nervous tubes had been obſtructed by the ſame action which converted the muſcle into tendon, all the nerves in the muſcle muſt be as deſtitute of ſenſation as in the tendon; for the ſenſation of a nerve depends upon the motion of its fluid.

The tendons being therefore a continuation of the muſcle, and having apparently the ſame nerves in its compoſition, cannot be ſuppoſed

deſtitute of permeable nerves, becauſe it is deſtitute of ſenſation; for, if that was the caſe, there could be no progreſſion of the nervous fluid from the belly, or ſenſible and fleſhy part of the muſcle: and if there was no progreſſion or motion of this fluid, beyond the part of the muſcle where it commenced tendon, it would ſtagnate, and there could be neither motion nor ſenſation in the fleſhy part, which is contrary to experience.

When a tendon is cut, it does neither bleed nor immediately exſude any fluid from the divided extremities; which is a conſiderable argument in favour of the ſuppoſition that it receives no blood.

Verum ut rubrae fibrae ſplendeſcent & tendineae fiant, neceſſe eſt vaſa earum, aut deleri, aut certe adeo arctari, ut ſanguinem repellant: ut una ex irritabili mollitie, in ligamentoſam duritatem tranſeant.—Illuſt. Haller. l. xxx. ſect. 1.

The conſequent gelatinous fluid, which afterwards appears, cannot proceed from the lym-

phatic or ſmaller arteries, which might have been made to cohere by exerciſe in that tendon; for it is evident, that the coheſion would firſt take place in the ſmaller arteries. This diſcharge, therefore, can only be ſuppoſed to come from the largeſt arteries in the tendon, which have not at that time perfectly cohered. But ſince the largeſt arteries tranſmit only a red fluid, this gelatinous exſudation can be nothing elſe than the nervous fluid, or the product of that ſecretion in the brain, which deſcends through the nerves from that organ, enters the muſcle, which it affects according to the velocity of its motions, and paſſes on through the muſcle into the perioſteum and bone, where it is applied in proportion to the force with which it is impelled by the muſcular exertions; ſo that the bones of the particular members of the body, that have muſcles of ſtronger powers inſerted into them, will neceſſarily be harder than others, and ſuffer ſeveral other effects which we ſhall explain in another work.

As the ſame nerve that is ſenſible in the belly of the muſcle, is inſenſible in the tendon,

it is evident that a nerve may be ſenſible in one part, and inſenſible in another, at the ſame time; and that parts of the body are not deſtitute of nerves, becauſe they are deſtitute of ſenſation. The coats of the arteries are ſenſible from the belly of the muſcle to the tendon, which is the point where they cohere; there the inſenſibility begins, and continues to its extremity or inſertions. The blood, however, will be in contact with the point of coheſion; but not being able to recover the permeability of the veſſels, will be carried off by the tranſverſe and collateral branches.

As the veſſels of the muſcles are liable to become impervious by motion, every flexion and extenſion which the muſcles perform, muſt reduce many of the veſſels covering the joints to a ſimilar ſtate. When the arm, for inſtance, is bent, the ſkin, and all the intermediate parts that cover the elbow, are drawn tight: for the veſſels ſuffer ſuch an acute flexion, that their internal ſides will be brought into contact, and cohere; and the blood that endeavours to paſs them, be carried off by the collateral veſſels.

We have already had occaſion to mention the cells interpoſed between the fibres of the muſcles, which contain a watery and oleaginous fluid, to preſerve them from being injured by violent frictions; we now proceed to mention a more remarkable congeries of them which communicate with the former, but have a more ſuperficial ſituation. Theſe make a complete involucrum or ſheath to the whole body, and are placed immediately below the ſkin. They contain the fat, and a lubricating fluid, which gives a ſoft, ſleek, uniform ſurface to the whole body.

This fluid is accumulated in thoſe parts of the body which partake of the leaſt motion, and is diſſipated in ſuch as are moſt expoſed to action, which is evidently one cauſe of the leanneſs of the joints. This circumſtance is ſufficiently apparent in the turgid integuments of the back of the hands, and upper parts of the feet of young children, and the thin appearance of the ſame parts in old active perſons. When the lubricating fluid, originally contained in the cells which cover theſe parts, is diſſipated, the cells will neceſſarily contract, collapſe, grow together,

and ſtrangulate the blood-veſſels that paſs thro' them to the ſkin.

Celluloſa tela ſubcutanea, in puero molliſſima, abit nunc in longa duraque fila, quorum robur ſaepe ſum admiratus, quando ad aures oſtenſurus nervos, cutem vetularum auferebam. Et tanta eſt hujus celluloſae nunc vis contractrix, ut in abdomine pro tendine habuerim, quæ erat linea alba, & utraque linea ſemilunaris, contracta hinc de cute eminens: ut aliquoties cum femora contracta eſſent, non alia cauſa reperta ſit adtractiorum artuum, praeter rigidam celluloſam telam, quae brevius femur contra truncum corporis replicabat. Illuſt. Hall. l. xxx. ſect. 3.

This ſtrangulation is effected by the ſame motion which diſſipates the fat. The arteries in this ſituation will ſoon cohere, and the blood which pervaded them be carried off by the collateral branches, and no immediate inconvenience follow.

Sed, ſanguis, aut vias, per coagulum, liberas percurrit, aut omnino in toto eo trunco quieſcit. Illuſt. Hall. Phyſiol. tom. I. p. 117.

Tantum enim abeſt a diſtentione canalium ligatorum, ut ſanguis vinculum fugiat, ramumque impervium inque communicantes arterias ſe recipiat, donec is, quem viciſti, omnino inanis ſuperſit.—Ibidem.

The blood-veſſels of the ſkin, and ſheaths of the tendons, between which theſe cells are placed, will alſo cohere, as well as many veſſels which ſuffer elongation by the flexion of the joint. But it is evident, that the facility of the coheſion will be in proportion to the diameters of the arteries. For an artery of one line in diameter will more eaſily cohere, than one of two lines, as the force of the heart acts more powerfully on the one than on the other.

When once a coheſion is formed in an artery, it will be continually tending to increaſe, if the ſame force be continued which firſt cauſed it. If an artery coheres at *a*, *plate I*, by an elongation of the veſſel over the finger, that reduced it to the figure *b*, and theſe flexions often repeated, or long continued, then the coheſion will increaſe, or be produced to *c*, ſince every elongation will ſqueeze the blood from *b*, the cohering point,

towards *d d*; the blood, however, when the veſſel is at reſt, will be continually in contact with *c*, and being urged on by the force of the heart, will attempt to get the better of the coheſion.

Coheſions of arteries will happen ſooner or later, in proportion to the violence of the motions of the joints; and arteries in other parts of the body may be liable to the ſame accident. It is, however, evident, that they cannot ſo readily cohere in the ſoft parts; for moiſture, being generally collected in the indolent and ſofter parts of the body, is unfavourable to coheſion; but the joints being in conſtant motion, the moiſture is by this means forced out of the cells which cover them; ſo that their integuments are more compact and firm than thoſe of the intermediate parts. Whenever the motion which produced this firmneſs is diſcontinued, it will be ſo far from being likely to increaſe, that the joints will not even be capable of preſerving the ſolidity they had already acquired; for whenever exerciſe gives way to an indolent inactive life, and this is continued for a certain number of years, the ſolids of the body will relax, and the fluids be retained in

greater quantity than would have happened had no ſuch change taken place. This relaxation will be more prevalent and quick, if luxurious diet be joined with eaſe and indulgence; but, however ſparing the diet may be, it is evident that the fibres will ſtill be much more ſoftened, than they could poſſibly have have been, had a proper and ſalutary exerciſe been continued.

This relaxation of the ſolids, and accumulation of the fluids, will be the ſooner manifeſted, according to the ſtate the ſolids are in at the time of this change of life, and to the manner of living after that period. It generally, however, makes its firſt appearance in an increaſe of fluids, for the compreſſed cells, before mentioned, are gradually opened by the watery and oily fluid flowing from the upper cells; and as this fluid is aſſiſted by a very relaxing heat, as well as by its own quality, it ſooner or later re-enters the cells which the former motion of the joint had made to collapſe. As the cells are diſtending, the ligatures which they formed about the arteries are taken off, and the arteries are again ſurrounded with moiſture. The indurated ſtate in which

they had ſo long continued, will then gradually ſoften, and the ſenſation of the nerves of their coats be increaſed.

This ſenſation appears to be chiefly promoted by a redundancy of the fluid which ſupports and pervades the nerves, and is an inferior degree of relaxation to that which has been ſometimes obſerved to ſoften the bones.

If theſe cauſes are continually operating, the coheſion will be ſo much relaxed, as to be inclined to ſeparate, eſpecially at the extremity next the heart; for we formerly obſerved the blood was continually in contact with that point of the coheſion: on which account the relaxation muſt be greater there, than at any other part of it; becauſe it has a relaxing fluid on all ſides at that end; whereas the other parts of the coheſion are only moiſtened on the outſide by the fluid contained in the cells ſurrounding it. All the hard coheſions will in this manner, therefore, be gradually reſolved, or the arteries that had been cloſed

for many years will again be diſpoſed to open; ſo that although the coheſion had, in its former inſenſible robuſt ſtate, reſiſted the ſolicitations of the heart, it can now reſiſt no longer. For let us conceive the diameter of the artery above the cohering point, to be ſtretched to the utmoſt it can bear without pain, it will neceſſarily be ſtill farther extended by the next impelling force. But as that force proceeds from the contractions of the heart, which are ſudden and pulſatory, the ſeparation will be haſtily begun, and the coheſion partially tore open, ſo that the lacerated nerves will excite a degree of pain in proportion to their ſenſibility, and the power of the contraction of the heart.

In this manner is the gout produced; for the fit begins with pain, which is the natural conſequence of an effort to open the artery, and bring it back to its original infantile ſtate.

From theſe preliminaries we ſhall venture to define the gout; an attempt in nature to rejuvenate the body, or recover the permeability, and renew the circulation in the arteries formerly cloſed by exerciſe.——*See plate II.*

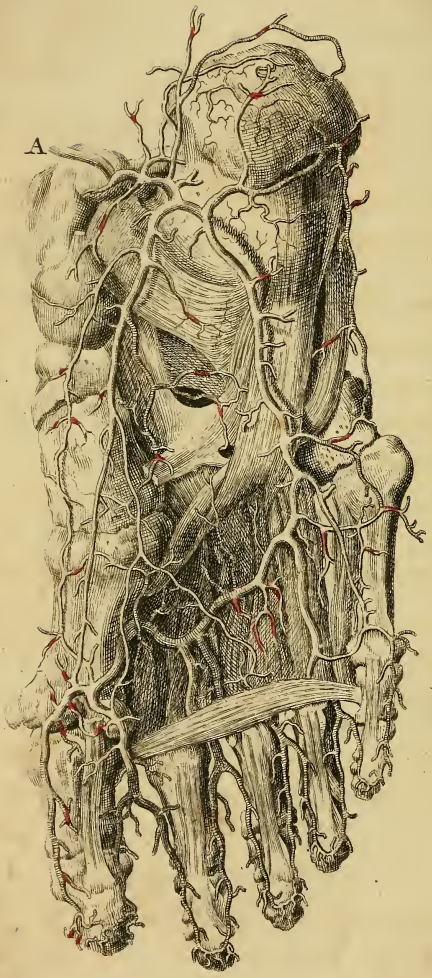
A

PLATE II.

A View of ſome of the arteries of the foot from the learned and accurate M. Haller.

The reader, who may be unacquainted with anatomy, ſhould be informed, that the blood is carried from the heart by a tube called an artery, which immediately divides, and diſtributes innumerable branches to every part of the body. The arterious ſyſtem has, therefore, been compared to a tree, with its root fixed at the heart. This will be illuſtrated by the figure, where the trunk A ſends branches which are ſpread over the whole foot; and this trunk communicates with the arteries deſcending from the leg, thigh, &c. in the ſame manner as theſe various branches in this foot anaſtomoſe and ſpring from the ſame trunk A.

The great trunk of all the arteries proceeds from the left cavity of the heart. This cavity is ſuppoſed to contain two ounces of blood. The ſides of the cavity are brought together, with great force, ſeventy times in a minute. This contraction expels the two ounces of blood into the trunk of the arteries. The arteries, being all full, could not receive this additional quantity, unleſs the blood they then contained was

to go forward. This accordingly happens; and the ſame quantity, the heart drives into the trunk, paſſes out at the extremities of the branches, allowing only what is loſt in the various emunctories of the body.

The extremities of the arteries end in veins, in the ſame manner as the extremities of the fingers of the left and right hands appear when placed upon each other. The veins return the blood to the heart, and by this means that organ is enabled to continue its contractions.

As the blood in the arteries is continually paſſing on from tubes of greater to thoſe of leſſer diameters, their ſides will neceſſarily be ſome impediment to its motion. When the heart, therefore, expels two ounces of blood into the trunk of the arteries, they are all affected by the accelerated motion of the blood, and ſwell a little. This ſwell in the arteries is the pulſe that follows every contraction of the heart, and is eaſily felt where the arteries run over the bones.

All the red points, in Plate II. are ſuppoſed to be arteries in a ſtate of coheſion, which have been brought to that ſtate by violent exerciſe. When this exerciſe is therefore diſcontinued, the ſolids relax, and the coheſions are with difficulty maintained; for they incline to ſeparate. This diſpoſition to ſeparation is haſtened by the powers of the heart, which is continually driving the blood down the trunk A againſt them. The coheſions are therefore ſtruck by the

force of the heart above 100,000 times every day. This great force is farther aſſiſted by the preſſure from the weight of the blood between the heart and theſe coheſions. The ſides of the arteries, at the cohering points, being continually acted upon by theſe powers, are at laſt partially torn open, and pain inſtantly begins.

The paroxyſm then goes on, and terminates either by burſting the artery, recovering its permeability, or leaving the coheſion in a partially deſtroyed ſtate.

CHAPTER III.

HAVING treated, in the former chapter, of the cauſe of arthritic pain, we ſhall now proceed to explain the manner in which it terminates.

When once the coheſions we have been ſpeaking of are partially torn open, the blood will immediately follow, and fill up the ſeparation, and be preſſing forward to continue and complete it. The nerves receive ſuch injury from this firſt laceration, that pain, which increaſes their natural ſenſibility, immediately enſues; and the ſame force which excited it, continuing for twelve hours, will ſharpen that pain every hour to the twelfth. Pain increaſes the ſenſibility of the whole nervous ſyſtem, as well as that of the nerves belonging to the injured artery. For the body, in general, ſympathizes when any of its parts are violently af-

fected. The heart will therefore ſoon become more ſenſible, and conſequently be more eaſily irritated, by the blood, to contract. From hence the quicker contractions of that organ in the paroxyſm.

Pain alſo increaſes the motion of the nervous fluid. For the motion of that fluid is known to be ſloweſt during ſleep; and it will ſurely be allowed, that the body is never ſo little inclined to ſleep as when in exquiſite pain. The nerves are therefore in a ſtate of the wideſt difference in pain and ſleep.

During ſleep the body is cold. This coldneſs cannot be owing to a ſlower motion of the blood, becauſe the pulſe is ſtronger and fuller at that time than when the body is awake. This indicates a greater momentum in that fluid. The heat of the body cannot therefore proceed from the motion of the blood; the body being coldeſt when that motion is moſt accelerated. Boerhav. Inſtitut. ſect. 590—6.

At vigiliae pulſuum numerum augent ; ita minuit ſomnus, dum calorem, & pulſuum adeo aliquam accelerationem a ſomni efficacia ſeparaveris, quae certe non ſomni, ſed veſtium & plumarum ſuper diurna velamenta infectarum effectus eſt ; cum iiſdem enim veſtibus dormiens, quae vigilanti ſufficiebant, certo frigebit.———Haller, vol. II. Phiſiol. p. 263.

As the nervous fluid moves ſloweſt in ſleep, and the body is coldeſt at that time, this coldneſs muſt be brought on by the tardy motion of the nervous fluid, and therefore the body muſt be heated, whenever the velocity of that fluid is increaſed.

The coats of the artery are more frequently diſtended after the laceration than before ; for the heart beats both quicker and ſtronger, in conſequence of the pain which followed it.

As pain accelerates the motion of the nervous fluid, and as heat proceeds from the ſame cauſe, the body will gradually be heated with the duration and vehemence of pain. But the nerves of the part affected are moſt violently heated, and the motion of their fluid quicker,

than in the neighbouring nerves; ſo that the part appears red from the rarefaction of the blood, occaſioned by the heat which the motion of the nervous fluid has excited; for the diameters of the capillary arteries are enlarged by the rarefaction, ſo as to make the blood more conſpicuous.

The ſurface of the part being ſo exquiſitely ſenſible, will nicely diſtinguiſh the ſtate of the atmoſphere, and at the ſame time that it is unſufferably hot, the part will feel exceedingly cold, and every undulation of the air will aggravate the ſymptoms; ſo that the ſame air which ſurrounds the other parts of the body, although ever ſo mild, is always complained of as too ſharp for the inflammation.

The whole body, however, may be obſerved to feel hotter to the touch of another perſon, than to the ſenſation of the patient, for the firſt effect of pain is analogous to that of cold. The whole body ſhudders upon the fall of one drop of cold water upon any part of it. The fluid in the nerves on which the water falls, is driven

back towards the root of the nerves, or the brain, and the fluid in other nerves of the body imitates the ſame motion. If this impulſe is more forcible by an increaſe of the cold, a freezing atmoſphere for inſtance, pain will follow the cold ſenſation. Now, if a nerve is in danger of being ruptured by extenſion, the cavity of it appears to ſuffer the ſame change as that of a larger tube in the like circumſtance. It contracts at the force which extends it; and this contraction repels the fluid to the brain. This may be demonſtrated by pulling a hair out of the ſkin. For a ſimilar ſhudder attends its extraction as followed the fall of the cold drop of water. Pain ſeems, therefore, to be only a great degree of cold which reverſes the natural motion of the nervous fluid. When that fluid continues to be ſtrongly repelled, by violent irritation in any particular nerve, the other nerves appear to forget their original ſympathy, and the body becomes hot from the more uniform and natural motion of the nervous fluid.

Dico omnes dolores conjunctos eſſe cum tremore nervorum momenti majoris, unde liquidum in iis con-

tentum, undis denſioribus, & breviore tempore oſcillantibus, verſus cerebrum revolvitur. Clift. Winterangham, ſenr. Tract. de Podagra, p. 122. Ebor. 1714.

The part will therefore be moſt florid over the place affected, and the colour diminiſhed toward the circumference.

All the arteries in this ſtate of diſtention will tranſmit their blood with more difficulty than uſual; ſo that the part becomes an impediment to the circulation in that extremity. This, joined to the prevailing ſenſibility of the nerves, produces a throb after every contraction of the heart.

The heated blood moving ſo ſlowly in the part affected, and being ſtill farther heated by the greater motion of the nervous fluid which the duration of the pain accelerates, at laſt diſtends the ſides of the cohering artery to the utmoſt ſtretch which their continuity will ſuffer without total deſtruction. The pain is then at the greateſt poſſible height, and muſt inevitably ſoon ter-

minate, becauſe the nerves can ſuffer no farther diſtention, and the ſame cauſe, which brought them to that point of ſenſibility, will attempt to increaſe it. Then follows, ſometimes, a greater pain, if poſſible, than had yet been felt; which is the effect of the laſt contraction of the heart. This proceeded from the rupture of the coats of the artery. It can therefore ſuffer no farther pain; for the fluid, which burſt it, runs out into the cells in which the artery was originally ſtrangulated, which it ſometimes diſtends in an enormous manner.

The moment the artery is torn open, and the pain vaniſhes, the motion of the nervous fluid, and conſequently the heat and ſenſibility of the body, inſtantly diminiſhes. The heat and irritation, which had occaſioned a dryneſs of the ſkin, being ſuddenly removed, all the cutaneous arteries relax and exſude a gentle moiſture. The part affected, being more parched than any other, and having been in a greater ſtate of ſenſibility, will be the firſt relieved, and the perſpiration will begin there. The perſpiration therefore in the part, and over the reſt of the body, is

evidently the conſequence of the rupture of the artery and termination of the pain, and is not the cauſe of the ceſſation of the pain, or the ſolution of the paroxyſm, as it has been hitherto imagined.

It will now be eaſy to explain the various appearances which have characterized the diſeaſe. We ſhall therefore proceed to an explanation of ſome of them, and be as brief as the ſubject will admit.

CHAPTER IV.

THE gout has been moſt certainly diſtinguiſhed from other diſeaſes, in its firſt attacking the great toe. This extremity ſuffers greater action in walking, than any other in the whole body; ſo that its arteries will be firſt ſubject to coheſion. They will for the ſame reaſon have larger diameters; for great action, or preſſure, will ſhut up arteries, on which a leſſer action could have no power. The diameters of arteries are known to leſſen by age; and the ſame effect may well be ſuppoſed to happen from ſtrong exerciſe, which evidently precipitates that natural ſtate. Their internal ſides will, therefore, be more eaſily brought into contact, and cohere.

Τὰ ποδὸς τὸν μεγαν δακτυλον αλγει. Aret. Cappad. de Sig. & Cauſ. Morb. diut. C. de Athritid.

Whatever be the ſize of theſe cohering arteries, it is ſufficient for our purpoſe to know that they muſt always be larger in the feet than in any other joints of the body, unleſs the feet have been leſs moved than other joints. Now it is well known that the blood always moves with the greateſt velocity in the largeſt arteries. Any coheſion, that exerciſe produces in them, will therefore be more ſtrongly ſolicited to open than in ſmaller arteries. But it has appeared, that the cohering arteries in the feet have larger diameters than thoſe of any of the other joints. Whenever, therefore, the preſſure and action which theſe extremities ſuffer by walking, is diminiſhed, and ſucceeded by a more indolent life, the artery is ſoon diſpoſed to ſeparate. Every contraction of the heart urges it, when the body is at reſt; and that force is aſſiſted by another very conſiderable one, the whole weight of the blood between the heart and the coheſion. This united force continually acting on the cohering point of the largeſt cohering arteries in the whole

body, muſt neceſſarily tear them firſt, which laceration commences the paroxyſm.

Although the pain begins in the great toe, yet it fixes in thoſe particular parts of it which ſuffer the greateſt friction; accordingly its lateral and internal extremity, and the lateral, internal, and upper parts of the firſt and ſecond joint, are chiefly affected when the gout is in the great toe.

The cellular membrane is ſo conſolidated in theſe parts of the toe, that the ſkin appears to ſtick to the bone. This proceeds entirely from the great friction of the ſhoes in walking; for the heads of the bones of the joints give a firm baſis to the force of this friction, and re-act upon the ſhoes; ſo that the veſſels of the ſkin muſt be more ſtrongly compreſſed, than over any other joint in the body.

Hence we imagine, that the firſt attacks in the great toe are ſeated in the cutaneous arteries; this ſuppoſition is confirmed by the appearance of the inflammation, and the deſcription the patient gives of the ſenſation, which is far more violent than the pains of future paroxyſms.

Although the pain generally begins in the great toe, yet this rule has many exceptions.

Very few people walk exactly alike; ſome bear more on particular parts of the feet than others. Theſe ſingularities will eaſily account for the different appearances. The general rule nature obſerves in the diſeaſe is this; firſt, to attack the joints, or parts of the body that once ſuffered the moſt compreſſion, or action, whenever that action has been long diſcontinued. If there are two parts in the ſame foot that have ſuffered a ſimilar compreſſion, both will be affected at the ſame time. If the compreſſion has not been quite equal in both, one will be affected after the other.

Accordingly Aretæus has long ago obſerved, that the pain next ſeizes the part of the heel which firſt touches the ground in walking. αυθις την επιπροσω πτερνην η ποτε στηριζομεθα. This part of the heel is evidently ſtrongly compreſſed, as the whole weight of the body falls upon it at every ſtep. The preſſure is, however, more momentary than that on the joint of the great toe. The back edge of the heel is often compreſſed when the body is ſitting or lying, and when the toe is in a perfect ſtate of eaſe. For when we ſit, and if the legs are a little extended, and the heels are on the ground, they ſupport the weight of the legs and thighs. This keeps the compreſſed arteries longer in contact, and renders the inequality of the preſſure in the different ſtates of reſt and walking leſs perceptible. Whereas the parts of the great toe already mentioned, receives much leſs compreſſion from ſitting, and for that reaſon the arteries in them are ſooner prepared to ſeparate than thoſe in the heel.

The pain, ſays Aretæus, next ſeizes the hollow of the foot. This is the center of motion be-

tween the heel and toe; and whenever the heel touches the ground in walking, the muſcles which run over that part begin to act. Their action is continued during the greateſt elevation of the heel above the ſurface of the ground; after which the foot is thrown forward, and their action is interrupted. Επειτα εις το κοιλον ηκε.

The hollow of the foot, however, evidently ſuffers leſs compreſſion than either the heel or great toe; ſo that the arteries, which are in a ſtate of coheſion in this part, muſt have leſs diameters than thoſe in the others. As they have leſs diameters, ſo they will not be ſo eaſily ſeparated, if they cohere: for the coats of the ſmall arteries are not only much ſtronger, in proportion to their diameters, than thoſe of larger ones, but the blood alſo runs ſlower in them. They cannot therefore be ſo ſtrongly acted upon by the blood, or be brought to that degree of diſtention which produces pain. This is manifeſted by the nature of the ſenſation when the gout fixes on this part; for it is never ſo violent as when it attacks the great toe.

That theſe arteries, in this part of the foot are affected, when many others, perhaps, of equal diameters, in the toe and heel, are not affected, is wholly owing to the following ſimple cauſe.

The hollow of the foot ſuffers no compreſſion when the body is at reſt. And the anterior part of the heel, and ball of the foot, keep it from touching the ground in ſitting. All the compreſſions in it can therefore only be affected by walking or riding. Now as thoſe who are afflicted with the gout, paſs moſt of their time in a ſitting or indolent poſture, the weight of the blood between the heart and the cohering arteries, joined to the force of the heart, is continually ſolliciting the coheſions to ſeparate; which ſeparation is the ſooner effected the leſs action the veſſels ſuffer. For action would have ſtrengthened the arteries, and retained them in a firm cohering ſtate; whereas inactivity as certainly induces a contrary effect.

Towards evening, ſays Sydenham, the pain adapts itſelf to the numerous articulations of the

upper part of the foot and inſtep. All theſe parts ſuffer a very conſiderable action, which, however, is much leſs than that in any of thoſe juſt mentioned. They are alſo much compreſſed by the ſhoes and buckles, by which the cellular membrane is ſoon condenſed, and the ſkin brought near the bone.

All theſe ſymptoms, however, do not conſtantly attend each fit of the gout. For we have often obſerved it confined to the great toe alone, and ſometimes to the edge of the foot behind the little toe; at others, in the back, and outer edge of the heel; but very frequently in the inſtep, or that part of the foot on which the buckle reſts; and many of them, when they are affected, appear only to ſuffer by ſympathy.

As Aretæus has made no mention of the inſtep in his enumerations of the places where pain is moſt commonly ſeated, ſo we ſuppoſe that anciently the gout did not attack that particular part of the foot. For as it is evident that it firſt attacks thoſe parts of the body which are moſt compreſſed, and as the ancients wore ſhoes

which did not confine the inſtep, we attribute this exemption to that circumſtance alone.

The ancient emperors, generals, and great men, wore caligæ. Theſe had a thick ſole tied to the upper part of the foot with thongs, which decuſſated each other, and ſpirally aſcended the ankle to the calf of the leg, but left the interſtices naked. Others again totally covered the feet and ankle. In the emperor Theodoſius's time, they came up as high as the knee. All, however, had their preſſure in their decuſſation from the foot to the leg, a little above the inſtep, or the ſeat of the modern buckle, as will appear from looking at the plates of the feet of ancient ſtatues, which the learned Montfaucon has exhibited, Tom. iii. p. 64 and 66.

The laſt tranſition of the pain, according to Aretæus, was, to the lower part of the tibia, or fore-part and inſide of the ankle where it terterminated with ſwelling. Το δε σφυρου εξοδηστε υστατου.

The ankle evidently ſuffered great friction from theſe thongs; and it was conſiſtent, with the uniformity of its method of attacking, to fix on this part rather than the inſtep, which was leſs expoſed to preſſure.

The gout, notwithſtanding this rigid uniformity, does not ſeize the ball of the foot, which ſuffers equal if not greater compreſſion than any part of the body. But this apparent contradiction proceeds from two cauſes: Firſt, from the ball of the foot being covered with a thick layer of fat, which prevents the preſſure from making ſuch large veſſels to cohere as in dryer and more naked parts: Secondly, from the conſtant degree of preſſure it ſuffers when the other parts of the body are in a ſtate of perfect eaſe and freedom. This equality of preſſure is a great ſecurity to any part; and is the chief reaſon why this part is often exempted, for many years, after the upper and lateral parts of the foot have been tortured with repeated lacerations. For although the gout is conſtantly obſerved to ſeize ſuch parts as were moſt exerciſed; yet it only

attacks them when their uſual motions are laid aſide.

Hence proceeds the intenſe pain, which at laſt ſeizes the ball of the foot. For, after a patient has been many years afflicted with paroxyſms in every joint of his extremities, by which they have obliged them to place their feet horizontally on a ſtool, during one half of the year, the uſual preſſure, which a little walking, or much ſitting, made on the ball of the foot, is then taken off, and it becomes ſoft and relaxed like the other parts. The largeſt compreſſed arteries then begin to ſeparate, and the pain, which follows their ſeparation, is perhaps greater than any they have ſuffered for ſeveral years; for, in general, the firſt fit in any one part of the body is more ſevere than a ſecond in the ſame part.

There may be ſome exceptions, however, to this genetal rule. For people, who have been accuſtomed to walk very much, and continued this exerciſe long after the meridian of life be-

fore they diſcontinued it, may ſo far diſſipate the fat in the ball of the feet, as to compreſs arteries of much greater diameters in this part than any other; by which circumſtance, when the tendency to relaxation prevails, theſe arteries are ſooner ſeparated than others of leſs diameters, and the firſt fit attacks them.

Plate III.

PLATE III.

REpreſents ſtill ſmaller arteries of the foot than Plate II. This may explain the difference between lingering and ſhort paroxyſms. For the blood will evidently run with leſs momentum in arteries of this ſize, than in ſuch as are ſhewn in the former plate. The paroxyſms occaſioned by the ſmaller arteries muſt therefore be moſt tedious.

CHAPTER V.

AFTER all the cohering arteries of the feet, which from their diameter were more diſpoſed to ſeparate than thoſe in other parts of the body, are deſtroyed; the future fits in the feet will from that time be leſs ſevere, becauſe the next arteries to be ſeperated are ſmaller, and the blood runs through them with leſs velocity.

The reaſon, therefore, of the quick termination of the firſt fits, and alſo of their greater violence, proceeds from the greater diameters of the arteries lacerated. We are therefore of opinion, that the firſt fits in any parts of the body are always occaſioned by a ſeparation of arteries that carry red blood; for, the more denſe the blood, the greater is its momentum, by which the artery is ſooner torn open, and, the quicker the laceration, the more exquiſite the pain.

Perſuadeor, dari minora vaſcula, ex arteriis rubris orta, ſed diaphana, nullius vitri ope conſpicua, quæ globulis ſanguineis impervia tenuius liquidum vehant : atque adeo erant iſta vaſcula inter terminos arteriæ rubræ. Illuſt. Hall. Phyſiol. v. I. l. ii. ſect. 31.

More tedious fits have been always obſerved to be leſs violent, and to follow others which have been more ſevere. They have been likewiſe obſerved chiefly to attend the decline of life.

Animadvertendum eſt enim, quod ubi quis ad multos annos podagra laboraverit, dolor ſingulis paroxyſmis gradatim imminuitur. Sydenh. tract. de podagra.

Theſe aged paroxyſms cannot be ſo violent, becauſe they are cauſed by arteries of the leaſt diameters, in which the blood is driven with much leſs force againſt the coheſion, than in the arteries which excite the firſt paroxyſms. Now theſe little arteries cannot be in a ſtate of ſe-

paration in the firſt fit, for the following reaſons.

A leſſer force, or compreſſion, will ſooner bring the internal ſides of an artery of one line into contact, than one of two lines. A leſſer power will therefore keep it cohering; and there is no healthy perſon whatever, who does not take ſome exerciſe every day, and this little exerciſe maintains the coheſion of the ſmaller veſſels, although it cannot have the ſame effect on larger.

The coats or ſides of the ſmall arteries are alſo proportionally harder than the large ones. They will therefore give a greater proportional reſiſtance to the force of the heart.

Nempe cum arteriæ ramorum duriores ſint, quam truncus aortae eſt, majus adeo cordi reſiſtunt. Illuſt. Hall. Phy. tom. I. p. lxxv. Clariſſ. Wintering.

But, when repeated fits of the gout, from the greater arteries, have reduced the body to the neceſſity of leading a more inactive life, the little action, which formerly kept the ſmaller arteries in

their ſtate of coheſion, is alſo taken off: then begin more tedious paroxyſms than had ever been experienced before; for the capillary arteries being innumerable, whenever the relaxation reaches them, there is a ſufficient quantity of coheſion to keep up a ſucceſſion of pains throughout life.

Every thing then conſpires to protract the fit. The veſſels affected are more numerous: they are ſmaller: they have harder coats: and their coheſions are acted upon with leſs force from the heart: they therefore excite leſs pain, leſs heat, and leſs rarefaction, the exceſſes of which bring on a more ſpeedy rupture of the artery in juvenile paroxyſms.

Theſe indolent pains do not proceed from a deficiency in the force of the heart, but entirely from the ſmall diameters of the arteries affected, which cannot poſſibly admit a current of greater force, ſo that a greater ſeparation might have been effected in a larger artery in the ſpace of twenty four hours, than could poſſibly happen in a much longer time in an artery of leſs diameter.

One joint, however, is not the only part affected; for, in every joint which formerly moved, ſome minute arteries muſt have been compreſſed; and whenever an interruption of that motion follows, theſe veſſels will tend to ſeperate. Accordingly the parts of the body, which ſuffer the next greateſt exerciſe, are next the ſeat of the diſeaſe.

In Aretæus's days, it flew in general from the feet to the hands, τα παλλα δε απο των ποδων εις χειρας πιπτει, from thence to the elbow and knee αυθις αγνων γονυ. And it may be obſerved to follow almoſt the ſame order at preſent; although it rather firſt attacks the knees than the elbows. This, however, is merely accidental; for it may either be prevented fixing, or brought to any joint of the extremities, by preſerving the uniformity of the motion of theſe parts, or by interrupting it. Both feet, both ankles, both knees, generally have an equal motion, and therefore one ſhould be affected as well as the other. It ſeldom happens that theſe joints are ſo equally exerciſed, as to have cohering arteries in a ſtate of ſeparation at

the ſame time; yet this ſometimes may happen. Both feet, both knees, ankles, or the oppoſite joints of different extremities, ſhall be ſeized at once. This only indicates an equal ſtate of coheſion in the arteries of theſe parts.

If the arteries in one knee are leſs relaxed than thoſe in the other, one will be affected after the other. If their is an equal relaxation in the cohering arteries of the great toe, of the left foot, and of the right hand, both may be ſeized at once. If there are cohering arteries, nearly in an equal ſtate of relaxation, in the knees or ankles, and the muſcles of the loins, the one will be in pain after the other.

Hence it is eaſy to account, not only for the apparent univerſality of the diſeaſe, but alſo for the inſtantaneous tranſitions of pain from one part of the body to another; for as the veſſels in every part ſubject to motion muſt be preſſed together, ſo that the blood is always in contact with their points of coheſion, whenever a general relaxation

is induced, one pulſation of the heart, by impelling the blood againſt ſo many coheſions, may excite pain in them all at once.

Great pain, from the laceration of veſſels in one part of the body, will evidently divert the mind from a leſſer pain in any other part. However, all theſe ſucceſſive pains not only manifeſt a very prevailing relaxation, but alſo tend much to protract the paroxſym; for no ſooner does an artery in the foot begin to ſeperate, than another begins to ſeperate in the knee the day following. This laſt takes off from the pain in the firſt artery, by which it is left partially deſtroyed, and the pain returns to it whenever that in the knee is alleviated. The pained artery in the knee is perhaps alleviated by a new ſeparation commencing in ſome artery of the hand or elbow, and alſo remains in a half ſeperated ſtate, which leaves a tenderneſs and innability in the joint, which however is not felt but when moved.

This ſucceſſion of attacks is ſometimes ſo quick, and the intermiſſions between them ſo

ſhort, as never to allow ſufficient time for the joint to recover the injury, before the ſame parts are again ſeized in a ſimilar manner. *Vix unquam dolores ſunt expertes, ſed ſenſatione aliqua plus minuſque moleſta perpetuo tentantur.* Sydenh. tract. de Podagra.

CHAPTER VI.

THE gout has been conſtantly obſerved to make its firſt viſit early in the ſpring, and to return annually for ſeveral following years.

People who are afflicted with this diſorder, having ſuch a preternatural ſenſibility of nerve from the neglect of muſcular action, cannot endure the cold air of winter without great uneaſineſs. They are therefore in great haſte to avoid it, and enjoy a more temperate zone in their own chambers, where they chearfully indulge their natural averſion to action, ſo that they ſtill take a leſs proportion of exerciſe than they did in the ſummer. This indolent life would require very little food, unleſs the appetite was frequently ſharpened by the weight of the atmoſphere of a froſty day, or repeated draughts of vinous and other fermented liquors.

During winter, the cutaneous evacuations are much diminiſhed, the urinary ſecretion is however more copious; yet this is evidently not analogous to the other; for many fluids are retained in this ſeaſon, which the mild heat of ſummer permits to fly off. Great collections of fat are not only formed in winter, in the particular parts of the body moſt favourable for its depoſition, but alſo the cellular membrane in general, is more replete with fluid in the ſpring, than at any other ſeaſon of the year.

All theſe effects are more ſuddenly and copiouſly produced where the ſolids are in a ſtate of greater relaxation. For weak veſſels are evidently leſs able to propel the fluids out of the body, than ſtronger ones. This is evident from the quick ſwell which bodies are generally obſerved to have after fevers.

Now, as the gout is produced by a general relaxation of the ſolids, ſo gouty conſtitutions will accumulate fluids faſter than thoſe who have firmer nerves. A greater proportion of fluids will therefore be taken in by them than is eva-

cuated; ſo that the blood-veſſels will be all turgid, and the intermediate parts full of that watery and oily fluid which gives ſoftneſs and uniformity to the ſkin. The appearance of the body before the paroxyſm manifeſts this change, for it never looks ſo turgid and well.

As inactivity was the original cauſe of the relaxation of the ſolids, ſo this relaxation will encreaſe every month throughout the winter. This part of the year is more peculiarly calculated for ſtudy than any other. All the conſequences of intenſe application will, therefore, be brought on: the nerves will relax, and become exceeding ſenſible, and the whole body be liable to be affected by the firſt change of weather.

We conſider a conſtitution of this kind as the moſt ſenſible plant in the creation, and that it will therefore firſt feel that change in the diminution of the gravity and elaſticity of the atmoſphere, which ſuddenly follows a diſſolution of the winter's froſt. The difference of gravity alone is ſometimes ſo great as to exceed the weight of 3000 pounds. Now the nerves of few people

are ſo very obtuſe as not to be affected by this change. And although theſe extreme differences, in the gravity of the air, ſeldom happen in forty-eight hours, yet they are ſo conſiderable as to be felt by the whole vegetable creation: for the confined air, in their ſeeds and roots, being relieved from the reſtraint which the heavy cold winter's atmoſphere had laid on it, expands, and promotes their vegetation.

Now, as there is ſuch accumulation of fluids in the blood-veſſels and cellular parts of the body, at the latter end of winter, which contain great quantities of elaſtic air, that is continually endeavouring to eſcape, *incluſam continent liquores omnes in corpore animali, auram quandam elaſticam, quae hanc habet naturam, ut vinculis ſoluta, in omnes partes vires ſuas exerceat.* Mead. de Lunæ & Solis imperio, p. 26. and only reſtrained in the veſſels by the 33,684 pounds weight of atmoſphere, *quorum impetum dum in canalibus ſuis fluunt aer corporis ſuperficiem ambiens reprimit.* Ubi ſupra. No ſooner is that preſſure leſſened to 32684, than the air confined in the blood, will, in the ſame proportion, expand—*This is evident from*

the tumefaction of any animal in the exhausted receiver of an air pump—and farther encreaſe the diameters of the arteries, by which the coheſions of the elements of the nerves, which formed their coats, is farther looſened and weakened, and rendered ſtill leſs able to endure diſtention. *Mutantur particularum minimarum coheſiones et nexus, ut ultra modum tenſi rumpuntur, ſubinde tenuiſſimi canaliculi.* Mead, ubi ſupra.

When all the veſſels of the body are in this ſtate of diſtention, from the expanding air which is involved in their fluids, and when the ſolids are likewiſe in a morbid ſtate of relaxation, the body will exactly imitate the inflated appearance which it is obſerved to put on ſome days before the paroxyſm. This ſymptom did not eſcape the attention of the illuſtrious Sydenham : *Januario exeunte, aut incipiente Februario derepente & nulla fere praeſenſione antecedente ingruit, niſi quod ventriculi cruditate & απεψια ad ſeptimanas aliquot aeger laboraverit; corporis inſuper intumeſcentia quaſi ventoſa & gravitate, quae indies augetur, donec tandem detonet paroxyſmus.* The ſides of the cohering arteries being gradu-

ally extended by this rarefaction of the air, are at laſt lacerated, and then the paroxyſm begins.

From what has been ſaid, it appears that no ſeaſon is ſo favourable to excite a ſeparation of the cohering arteries as the ſpring, becauſe the fluids are never ſo copious as at that time. And although as great changes do happen in the gravity and elaſticity of the air in other parts of the year, yet there is never ſuch a combination of circumſtances at any other ſeaſon.

We cannot help taking notice of the wonderful analogy between this *rejuvenating* principle in the human body, and the vegetative one in plants, as alſo of the coincidence of time in which both effects are manifeſted.

The firſt paroxyſms cannot be oftener produced than once in the year, becauſe the ſeparations of the arteries cannot be affected without the concurrence of the former circumſtances; and this can only happen in the ſpring. However, when the conſtitution is more aged, and farther relaxed, a greater quantity of fluids will

not only be collected in a ſhorter time, but the ſeparating arteries will alſo give leſs reſiſtance; ſo that a fit is as eaſily produced in the middle or beginning of January, as it uſed to be about the ſame time in February. The year following, if the ſame way of living be ſtill perſervered in, the nerves will be in greater ſtate of relaxation than they had been ever before; a leſſer force will therefore be required to complete the ſeparation of the arteries, and a fit be brought on in November. If the perſon has little pain from this fit, he will have reaſon to fear that his nerves will ſo far relapſe into their former ſtate, before April, as to ſubject him to a ſecond fit in that month. But if he can hold out till ſummer, he will have no reaſon to be apprehenſive of any return before autumn, as the heat of that ſeaſon diſſipates the fluids of the body, and eſpecially that of the nerves.

CHAPTER VII.

ALthough the ſpring is the moſt favourable ſeaſon for effecting the firſt laceration, yet there is another material circumſtance which aſſiſts in producing it.

As not only the firſt, but every ſucceeding fit, is brought on by the force of the heart, ſo it is evident, that a laceration is never ſo liable to be made, as when its contractions are moſt powerful and ſtrong.

The contractions of the heart are never ſo ſtrong, equable, and full, as in ſleep. Boerh. Acad. Lect. ſect. 590.

Magnus pulſus a vi robuſti cordis quam plurimus ſanguis impellitur. Hall. Phyſ. Vol. ii. p. 268. It muſt, therefore, be full before it contracts, and will drive the blood deeper into the aorta.

All that fluid, therefore, contained in the arteries between the heart and their extremities, where they commence veins, will be moved with greater velocity. It will, for the ſame reaſon, ſtrike the cohering arteries with greater force, and of conſequence be more liable to burſt their coats; more eſpecially as this great force is farther aſſiſted by the rarefaction of the air cauſed by the heat of the bed in the firſt ſleep. Accordingly it has long ago been remarked by the accurate Sydenham, that the firſt paroxyſm begins in the firſt ſleep; and from what has been already mentioned, it will appear, that it is never ſo much to be expected as at that time.

There are, however, many exceptions to this general rule. For this paroxyſm is frequently obſerved to begin in the morning, when the perſon firſt gets out of bed, or in any other ſucceeding part of the day. Theſe inſtances only manifeſt the proximity of the degree of diſtenſion to pain, which the nerves of the artery ſuffered in the preceeding night. The pain would have commenced in ſleep, had the ſleep

been a little protracted; for the nerves were, upon waking, almoſt extended to the ultimate ſtretch they could poſſibly endure, without exciting it. Now, although the contractions of the heart begin to be weaker when ſleep terminates, yet they ſtill continue; ſo that many ſmall contractions being adequate to few great ones, the nerves are lacerated by them, as well as by the nocturnal ones; and pain may commence at any time of the day.

When the paroxyſm begins in the day, it may be obſerved to encreaſe very gently. For the patient may reckon many intermediate degrees in the ſenſations of the part affected, between the time it firſt attracted his attention, and that wherein it firſt began to pinch him. Theſe deliberate progreſſions are entirely owing to the quicker and weaker contractions of the heart, which cannot ſo ſoon complete the deſtruction of the coats of the artery, as the ſtrong nocturnal contractions of that organ.

CHAPTER VIII.

IN many conſtitutions the body ſhivers when the paroxyſm begins; and in many others a ſhivering and fever precede the paroxyſm ſeveral days. It having been already obſerved, that the extention of a nerve affected the nervous fluid, much in the ſame manner as cold, this phenomenon will now be eaſily underſtood. For as coldneſs in the human body proceeds from a diminiſhed motion in the nervous fluid, and the extention of a nerve interrupts entirely that motion in the extended nerve, ſo the univerſal rigor ſucceeding the commencement of pain in the gout, is produced only by the other nerves imitating the ſtate of thoſe which are preternaturally extended. The whole body manifeſts a ſympathy for the affection of any of its parts. *If a drop of cold water falls upon a warm ſkin, the whole body ſhudders. The effluvia of certain ſubſtances communicate vigour to ſome bodies, whereas they affect ſome*

delicate women with fainting and convulſions. Muſic can excite or calm various paſſions. Melancholly, watfulneſs, troubleſome dreams, follow diſorders of the ſtomach. Grateful food, ſtrong wine, and other ſpirituous liquors, no ſooner touch the ſtomach of one ready to faint from emptineſs, than they communicate new life and vigour to the whole body; and, on the other hand, ſeveral poiſons occaſion violent ſickneſs, vomiting, fainting, tremors, convulſions, ſtupidity, an intermitting pulſe, difficult breathing, coldneſs of the extremities, and other ſymptoms; a fever, delirium, and other ſymptoms, have been produced by a pin ſticking in the coats of the ſtomach; and worms affecting either this part, or the inteſtines, occaſion a ſurpriſing variety of ſymptoms.

Epileptic fits have proceeded from a rough bone, or cartilaginous ſubſtance irritating the nerves of the great toe, or the calf of the leg, and the wound of a tendon or nerve, has been the cauſe of a fever, delirium, tremors, violent convulſions, and death. Whyte on Nervous Diſorders, p. 12.

Theſe inſtances not only manifeſt the general ſympathy the whole body ſhews for any part of it, but alſo prove, that one conſtitution may be more eaſily affected by the ſame cauſe, than another. This laſt obſervation may help to explain the reaſon of the ſhivering and fever which frequently introduce a paroxyſm, and which have been hitherto ſuppoſed to proceed from a very different cauſe.

Suppoſe the number 1 to be the natural ſtate of a nerve, and that it will ſuffer an extention of 11 before it breaks; ſuppoſe farther, that it will ſuffer an extention of 5 before its ſituation is noticed, then an extention of 6 will be attended to; 7 will be uneaſy; 8 painful; 9 very painful; 10 excruciating; and then the nerve breaks.

As the rigor and ſhivering do not come on in many perſons before the nerves ſuffer an extention of 6 or 7, and become uneaſy, it is evident that this peculiar degree of extention is neceſſary to produce the ſhivering in that conſtitution. But as the ſhivering often precedes any

ſenſation whatever, ſo in theſe caſes the body ſympathizes with the ſituation of the injured nerves, before the extention of 5, or below the attention of the mind. Hence the cauſe of ſome fevers may be accounted for; but we ſhall wave this at preſent, as being foreign to our ſubject.

CHAPTER IX.

IN this diſeaſe there is no beginning ſenſation ſo general, and leſs imaginary, than that which imitates a ſprain and diſlocation of the bones. The heads of the bones of the feet, at the termination of the paroxyſm, ſhall alſo appear to be removed at a conſiderable diſtance.

A ſprain from an external cauſe is only a preternatural extenſion of the nerves in the ligaments and veſſels ſurrounding the joints, from an attempt in the heads of the bones to get out of their confinement. A fit of the gout is likewiſe occaſioned by an extenſion of the nerves of ſome of the veſſels of the joints; ſo that an external or internal injury, elongating the ſame nerves, in the ſame manner and place, beyond their natural tone, ſhould certainly excite the ſame ſenſation.

In a ſprain the nerves are not deſtroyed, but only weakened; and they are in the ſame ſtate in an incipient ſeparation of an artery, which is the beginning of a gouty paroxyſm. This kind of ſenſation muſt, therefore, be raiſed in the joint, whenever the nerves affected are ſeated in the ligaments and tendons of the part.

Sometimes the paroxyſm begins with more violence, and the joint feels perfectly diſlocated. This proceeds from a great contraction of the heart, or a weak reſiſtance in the coats of the artery, by which they ſuffer a greater degree of diſtention. For a ſprain being only an incipient diſlocation, the ſame force, which brings it on, will, if continued, complete it.

If the nerves only of one artery are thus extended, thoſe of the whole joint will appear to be equally affected. But the ſudden commencement and termination of the pain evidently ſhew, that this cannot really be the caſe. All the other veſſels ſurrounding the joints are, therefore, only affected by ſympathy.

As this ſenſation of ſprain and diſlocation frequently begins the paroxyſm, the inflammation, which immediately follows, urges the nerves to farther elongations, and diſtends the diameters of the neighbouring arteries. By theſe efforts the veſſels are lengthened, and their tone ſo much weakened, that at the termination of the fit they are unable to confine the articulations, ſo that the heads of the bones feel looſe, and as if they were ready to be diſlocated by the leaſt motion. This ſenſation continues for a conſiderable time, till the veſſels recover their former contractile powers.

CHAPTER X.

WHEN the diſeaſe is in an advanced ſtate, Sydenham has obſerved, that the ligaments of the bones of the feet are very liable to be ſtrongly convulſed in the morning after yawning, and that this is attended with a powerful conſtipation of the whole foot. This ſymptom has been deſcribed as if the foot was forced into an exceeding tight ſhoe. *Id etiam in hoc morbo, quoties jam confirmatior eſt, incommodi accidit, quod ab oſcitatione, imprimis vero matutina, ligamenta oſſium metatarſi vehementer convelluntur, cum ſenſu quaſi coarctationis vel compreſſionis fortiſſimae a manu valida.*

Yawning is only a deep inſpiration which expands the air bladders of the lungs. This expanſion accelerates the motion of the blood through them, and ſends a greater column to the right auricle and left ventricle of the heart. The

heart will, in conſequence of the greater influx of blood, be more diſtended, and the blood, by the next contraction of that organ, more powerfully driven into the aorta. The cohering arteries will then be ſtruck with greater force, and a partial ſeparation ſuddenly begin. This irritation eaſily induces a ſpaſm on the neighbouring parts, which are ſuppoſed to have been all previouſly injured by repeated paroxyſms, and, on that account, the more eaſily affected.

Sometimes a ſymptom, more violent than the former, breaks in upon a beginning ſleep, and wakes the patient with a ſenſation, as if the bones of the metatarſus ſnapped like a broken ſtick. This is preſently followed by excruciating cramps. *Quandoque nulla oſcitatione praecedente, æger jam ſe ſomno committens, ictum quaſi clavæ metatarſum confringentis derepente perſentiſcit unde cum ejulatu expergiſcitur.* Syd. tract. de Pad.

There appears to be little deception in this ſenſation; for although the bones are not broken, yet the nerves of the arteries which enter them are ſuddenly ruptured. This will be the

more eaſily admitted when it is conſidered, that they have been often partially ſeparated and left by accidental perſpiration in a half deſtroyed ſtate. The ſame reaſon, therefore, which is the cauſe of the firſt paroxyſm, and which produced the preceeding ſymptom, effects this rupture. The rupture cannot happen in the day, becauſe the one or two ſtrong contractions of the heart, produced by yawning, are inſufficient to perfect the deſtruction of an artery; for the yawning is ſoon over, and the force of the heart immediately leſſens. But in ſleep the lungs are ſo much diſtended, as to imitate a perpetual yawn at every inſpiration. The nerves of the cohering arteries, being at the ſame time leſs ſenſible, do not give ſuch early notice to the mind of their dangerous ſituation, ſo that they are extended beyond that ſtate where pain would commence was the body awake. By this they are elongated the nearer to a ſtate of deſtruction, and are accordingly broke by the next contraction of the heart, and the perſon is rouſed from that lethargy which had ſubjected the part affected to this accident.

If there are any cohering arteries in a muſcle where it commences tendon, inclined to ſeparate, the irritability of the muſcle is ſenſible of the incipient ſeparation before the mind, ſo that the motion of the nervous fluid is increaſed in the muſcle, and its contraction affected, without the intention of the mind. A cramp is therefore only a violent contraction of a muſcle, from an incipient ſeparation in any of its arteries, or a rupture of any in its neighbourhood.

CHAPTER XI.

THE gout ſeldom attacks women, becauſe their manner of life is more uniform and temperate than that of men, and becauſe their periodical evacuations prevent the bad conſequences of redundancy, which would otherwiſe follow their inactive and indolent life. They ſeldom take ſo much exerciſe as is ſufficient to form theſe coheſions in the arteries which can only lay a foundation for the arthritic pain; and if no coheſions are formed, it is impoſſible the diſeaſe ſhould exiſt. When women, however, have led very active lives, they are equally liable to be affected with the gout as men, although it commences at a later time of life. *Podagra fœminas perraro infeſtat, eaſque non niſi jam vetulas, & viragines, ſeu corporum maſculorum habitum æmulantes.* Sydenh. ubi ſupra.

Αλλα ανδρες μεν πασχειν ρπιτερον γυναιμον δε ελαφροτερον. Arat. Capad.

CHAPTER XII.

AS an acquired gout proceeds from a general relaxation of the *ſolids*, an hereditary one undoubtedly ariſes from the ſame cauſe. An hereditary gout will, however, be the moſt inveterate, becauſe the ſoftneſs of the fibres, in perſons afflicted with it, is more prevalent, which will make their veſſels more liable to be compreſſed. Their veſſels will not only be more readily compreſſed, but will alſo, for the ſame reaſon, be more liable to open, and the paroxyſms, of conſequence, be more frequent and tedious.

Suppoſe two men, of ſimilar ages, and apparently ſimilar conſtitutions, who had, from infancy, mutually and equally ſhared every exerciſe and exceſs: Suppoſe alſo the ſolids of one of theſe men to have been produced from healthy parents, and in an excellent natural ſtate, and thoſe of the other the reverſe: ſuppoſe farther,

that the active life, which they both led to the thirtieth year of their age, was changed to an indolent and ſtudious one; it will eaſily be granted, that the relaxation, which will ſoon follow this change of life, muſt always be moſt prevalent in the man of the ſofteſt nerves; ſo that the cohering coats of his compreſſed arteries will be ſo far ſoftened in the thirty-third year of his age, as to excite a paroxyſm of the gout. On the contrary, the firſt paroxyſm will not probably attack the other man before the fortieth year of his age. The firſt fit may not only happen ſeven years earlier in the relaxed than in the ſtrong man; but all the future fits will be more ſuddenly repeated; relaxation alſo being moſt prevalent, ſome of his vital organs will be ſoon ſo far debilitated, as to be inſufficient for performing their natural functions; ſo that he will ſoon be deſtroyed, or incapacitated for all voluntary motion.

CHAPTER XIII.

THE chalk-ſtones in the gout are compoſed of the earth the brain ſecretes from the blood for the ſupport of the ſolids. This earth deſcends the nerves in a highly diluted ſtate, and paſſes through the muſcles to the bones, where it naturally is depoſited. It excites heat in the body by its friction; which heat is accordingly increaſed in proportion to its various velocities.

Whenever the nerves, in which this earth runs, are broken by the rupture of the coats of an artery, there is an extravaſation of this fluid along with the fluid of the artery; and this produces the ſwelling which generally terminates the pain. This ſwelling quickly diſappears, if there are abſorbing veſſels enough to ſuck up the fluids that have been diſcharged from the ruptured nerve. But when the gout becomes more inveterate, and the ſeat of the pain is deeper, among

the ligaments, and in the joints, the abſorbing veſſels in theſe parts are deſtroyed by the ſame preſſure which firſt compreſſed the arteries; ſo that a rupture no ſooner happens there than the earth muſt remain where it is depoſited; and the moſt aqueous part of the arterial fluid, which ran out along with it, being diſſipated by the heat of the body, the remaining gummy and ſerous part of it forms a paſte of the terreſtrious or nervous ſecretion, and produces theſe ſoft unctuous concretions.

The ſtate of the brain is ſometimes ſo morbid as to ſecrete amazing quantities of this earthy ſubſtance. Pechlin ſaw ſeveral young men of the moſt apparently robuſt and beſt habits of body ſweat a kind of tophaceous matter at thirty years of age. L. ii. obſerv. 25.

One of them died before he was forty; and ſuch was the general tendency of his humours to a chalky nature, that whatever he ſpit or ſweated, was rendered white from the abundance of this gypſeous matter. Ut quicquid redderetur ſputi, ſudoremque, præ gypſi copia candeſceret.

A perſon under fifty years of age, who had ſuffered ſome ſlight fits of the gout, was ſo ſenſible of cold, that he could not bear to be without a fire in his bedchamber, even in the middle of ſummer. This gentleman, all at once, began to make urine white as milk, which, when allowed to ſettle, became pellucid, and let fall a copious white ſediment, which at firſt appeared like ſoft clay, but in an hour after hardened into white chalk or plaiſter-lime. He continued to void ſuch urine without alteration for the ſpace of nine months, inſomuch that he reckoned ſixty pound of this chalky matter had been voided. Acad. de Scien. 1747. Vid. Swieten Com. Vol. xiii. p. 98. tranſlat. into Engliſh.

I once had an opportunity of ſeeing a gentleman who had a ſimilar evacuation by the ſame emunctory. But his came away at firſt in great quantity, and quickly terminated.

Great quantities of a glary white matter has been obſerved to run out in ſome ſpecies of the diſeaſe, and with very little pain; for the nerves are eaſily broken in this relaxed ſtate, and their ruptured extremities long kept open. Theſe

evacuations, however, all happen in the ſuperficial and muſcular parts, where there is leſs reſiſtance to its formation. For whenever it runs out between the heads of bones, or within the ſheaths of the ligaments, it cannot be depoſited in ſuch quantity, and muſt alſo neceſſarily remain a more conſiderable time, in that ſituation, before it is thickened by the loſs of its aqueous parts.

From theſe inſtances it is evident, that the brain may be ſo relaxed, as to ſecrete greater quantity of this terreſtrious matter, than is neceſſary for the purpoſes of nutrition. But whenever the ſecretion of any particular organ of the body is increaſed, the fluid, which is the product of that ſecretion, is conſtantly obſerved to have a thinner conſiſtence. The nervous fluid will have, of conſequence, a greater reſemblance to the fluid in the ſanguineous veſſels, which is of a lighter and more aqueous quality, as it has a greater quantity of theſe lighter fluids in its compoſition, and it will deviate in the ſame proportion from its elementary nature.

As the nervous tubes are ſo preternaturally ſoft, and the fluid which pervades them ſo aqueous and light, leſs friction will be excited by its motion. Accordingly, in one of the above inſtances, the perſon was ſo cold as not to be able to ſit without a fire in the hotteſt day of ſummer. All gouty people are exceeding cold, and ſenſible of cold, which proceeds from the ſame cauſe.

CHAPTER XIV.

SYdenham has told us, that thoſe who are ſubject to the gout have large heads. *Iſti, qui huic morbo ſunt obnoxii, crania habent grandiuſcula.*

The head, when the fœtus becomes firſt viſible, exceeds the magnitude of the whole body. *Caput ſub primordia fœtus prægrande eſt, & reliqui magnitudini corporis diu æquat, & ſuperat.* Illuſt. Hall. Phyſ. Vol. viii. p. 361. When the fœtus is the weight of an ounce, the head, at that time, is equal to the body. Bartholin. Epiſt. iv. p. 538. When it is fourteen lines, the head is ſeven of them. Bueggrav. aer. aq. loc. Francfort. p. 156. Grew ſays it is the half of the fœtus. Harvey, p. 56, ſays, it is at firſt greater than the body. Pliny has obſerved the ſame circum-

ſtance in the chicken, L. x. c. 53. Cowper ſays, that it is greater than the body in the 25th day of impregnation; and others, that it is greater than both the thorax and abdomen. Illuſt. Hall. Phyſiologia. Tom. viii. At birth the head is a third of the whole body; and when the body is at its full growth, the head is only the ſeventh or eighth part of it.

The brain of a child being larger in proportion to its body, than that of an adult, ſo it is alſo generally larger in gouty perſons, in proportion to their bodies, than it is in healthy and active men.

The nerves of children are alſo more ſenſible than thoſe of adults; and this appears to proceed from their ſuperior ſoftneſs; the nerves of a gouty conſtitution are alſo known to be more ſenſible than thoſe of a healthy one, or more eaſily affected by a gentle cauſe.

The preternatural magnitude of the head in gouty perſons, and ſenſibility of the nerves, are

therefore farther proofs of the tendency of the conſtitution to its original infantile ſtate.

As an eaſy indolent life tends to bring back the bodies of adults to their primitive relaxation, the bodies of children are liable to ſuffer ſimilar conſequences from the ſame cauſe.

If a child has a morbid ſoftneſs of ſolids given it by inheritance, the bones will remain too long flexible after birth, and be unable to reſiſt the action of the muſcles, or the weight of the body, without being diſtorted. If the ſolids of the child are even ſufficiently firm, he will ſtill be liable to fall into the former misfortunes before the eighteenth month of his age, unleſs care be taken to keep him conſtantly in proper exerciſe.

It may be obſerved of the rickets, that it ſeldom begins to appear before the ſixth or ninth month. About that age children pay more attention to the many wonders that ſurround them, than they did before. This muſt ſtrongly affect their delicate brain, and promote a greater ſecre-

tion of nervous fluid. If the child be at the ſame time in a ſtate of reſt, no other evacuation is given it than what the ſenſibility of the nerves, and the motion of the heart, effect. This will ſoon reduce their whole body to a ſtate of great relaxation. Indolence has, therefore, been juſtly aſſigned as the cauſe of the rickets. But no ſooner is a child at reſt, than he requires ſome object to divert him; and if care is not taken to prevent this indolent habit, he ſoon becomes fonder of this object than any other amuſement, for he grows averſe to motion, and is ſatisfied with his ſedentary life. He may now ſoon be obſerved to have a large head, a grave compoſed intelligent countenance, and his capacity encreaſed far beyond the age of his coevals. Theſe mental acquiſitions are the conſequences of ſerious obſervations, and deep attention to the objects of his amuſement; although his body, in the mean time, is ſuffering more alarming injuries than the philoſopher is expoſed to from hard ſtudy.

Aſſerimus ergo morbum hunc rariſſime infantes, mox a partu, aut ante ſemeſtrem aetatem, imo forte

ante nonum menſem, corripere. Gliſſon de rachitide, p. 219.

This preternatural magnitude of the head in the rickets always precedes the ſoftneſs of the bones, and the larger the head the more obſtinate the diſeaſe.

Quo enormior eſt moles capitis, eo longior & difficilior curatio. Gliſs. p. 289.

As the heads, both of children and adults, acquire a preternatural magnitude by indolence, this effect appears to be chiefly produced by the action of the mind on the brain; for when the mind acts but partially as in ſleep, the ſecretion of nervous fluid is nearly at an end in the nerves, influenced by the will in that organ, which is the cauſe of the coldneſs of the body at that time. A ſtimulus of the mind is therefore requiſite to carry on a proper ſecretion in the brain; and whenever this is leſſened, the ſecretion and ſenſibility of the nerves is diminiſhed.

The nervous fluid, ſubſervient to the will, being chiefly ſecreted when the body is awake, this ſecretion will be the more copious in proportion as the faculties of the mind are moſt powerfully exerted; for it is leaſt when the mind is more at reſt. Now, as the mind is generally moſt ſtrongly exerciſed at the time when the body is in perfect reſt, there muſt be a great influx of nervous fluid into the nerves, and no ſufficient evacuation for it; for there is no exertion in the muſcles of voluntary motion to carry it off. Its progreſſion muſt therefore be very ſlow. Hence the coldneſs of ſedentary people. It muſt alſo, for the ſame reaſon, be accumulated in the nervous tubes, by which their cavities will be enlarged; the fluid will then bear a greater proportion to the nerve; the nerve, of conſequence, will occupy more ſpace, be ſofter and more ſenſible.

The action of the mind, for one day, is ſo conſiderable, as to encreaſe the contractions of the heart, and ſoften the nerves of the whole body, provided it is at reſt. This is manifeſted by the encreaſe and quickneſs of the pulſe in the evening. For the ſame heart that contracts ſixty-

ſeven times in the morning, will beat eighty in the evening; and although a few of theſe additional ſtrokes may be excited by the ordinary food, yet an equal number, at leaſt, may be allowed for the encreaſed proportion of nervous fluid in the tubes.

This encreaſed number of contractions, in one day, is ſtill more conſpicuous in diſeaſes. The great ſenſibility the nerves are reduced to, by the diſeaſe, makes them more ſenſible of the action of the mind; a greater quantity of nervous fluid is therefore ſecreted in a day of ſickneſs than in a day of health; the nerves will conſequently have more fluid in their tubes in the evening than in the morning; they will be ſofter, more ſenſible, and ſuſceptible of pain. Theſe facts are confirmed by the univerſal teſtimony of obſervation in every diſeaſe.

It is thus intenſe application of the mind, joined to inactive life, muſt be perpetually tending to relax the ſolids, and encreaſe the diameter of the nerves, and alſo the diameter of their extremities or roots in the brain. If the ſutures of

the bones of the ſkull are completely oſſified and ſhut up, before the active life be changed for a ſedentary and ſtudious one, it is eaſy to imagine what bad conſequences may follow; for it is probable that moſt paralytic diſeaſes, as well as unformed gouts, proceed from this cauſe. Exerciſe is the moſt proper expedient to prevent this preternatural ſwell of the brain, or relieve it if already formed. A ſmall head is always a characteriſtic of ſtrength, and the effect of powerful muſcular exertions. It is evident from the ſmallneſs of the heads given to the ancient ſtatues of Hercules, that the artiſts who wrought them were ſenſible of this truth; for as this is the effect of muſcular exertion, ſo it is always a characteriſtic of ſtrength. A large head, on the contrary, has ever been conſidered as a mark of a weak body.

The ſutures of the ſkull in a child, are, however, ſeldom cloſed at the time of life when the rickets have been obſerved to commence. They will, therefore, be leſs ſubject to paralytic diſeaſes, as the expanſion of the brain will meet

with little reſiſtance from the bones. Hence the enormous ſize of that organ in this diſeaſe.

The head of a child in the rickets recovers, in ſome meaſure, the proportion it had to the body before birth; and the texture of its body manifeſts a tendency to its original fluidity.

Cerebrum in fœtu fluidum deinde molle pultaceum, & etiam ſub tempora partus non ejuſmodi eſt, ut figuram tueri, aut ad oſtenſiones adhiberi poſſit. Illuſt. Hall. Vol. viii. p. 361.

The brain of a child being ſofteſt in the womb, the ſecretion of nervous fluid muſt be moſt aqueous, and leaſt terreſtrious, at that time. The bones cannot therefore be ſo hard.

As the ſoftneſs of the bones in the *utero* proceeds from the apparent fluidity of the brain, the bones, at any future period of life, muſt neceſſarily tend to their original flexibility, whenever the brain approximates to its original or fœtal ſtate.

A child, however, in the rickets, cannot have the gout, as it cannot be ſuppoſed that any of his arteries are cloſed at that early period of life. If a diſeaſed child cannot have the gout, it is equally impoſſible for a healthy one to be affected with it; but children may have it when any of their arteries are brought to cohere, which may ſoon happen if their infantile exerciſes are violent.

A general relaxation of the ſolids is the cauſe of both the rickets and the gout. This relaxation evidently ſprings from the brain; for both diſeaſes are hereditary; and all family diſeaſes can only be referred to the nerves, which are elongations of that organ.

Although a general relaxation of the ſolids is the cauſe of both the gout and rickets, yet it is more improbable that a child in the rickets ſhould be ſeixed with the gout, than an adult in the gout with the rickets; for the veſſels being all permeable in the rickets, and this permeability being ſtill preſerved by the nature of the diſeaſe, a paroxyſm of the gout cannot be produced:

but in the gout, when the relaxation has prevailed ſo far as to ſubject all the cohering arteries to ſeparation, the bones may then be ſoftened, and reduced to a ricketty ſtate. Several ſurprizing inſtances are related, which confirm this opinion, although the cauſe of this phenomenon was never before explained.

A perſon in the twenty-fourth year of his age began to complain of a pain about his heel, knees, and upper joints of his thighs, which were judged to be arthritic. In a year after, pains all over his body were ſo violent that he was obliged to keep his bed almoſt perpetually; then the bones began to ſoften, until the whole bones of his body became ſo flexible as to bend like wax, without the leaſt pain, into any form whatſoever. But from the contraction of the muſcles, and their having no longer a due reſiſtance from the bones, the length of the body was ſo much diminiſhed, that the poor afflicted perſon, who had been formerly of a very proper ſize, now dwindled away till he became no bigger than a child of three years of age; yet, motion only excepted, all the other functions remained as well as ever. He lived in this condition to the thirty-ſecond year of his age; but a

month before his death the pains returned, and continued, without interruption, to afflict him till he expired. Act. Hoffman. Vol. iii. Traite de Malad. des Off. Tom. i. pref. pag. 138. Clariff. V. Swiet. Vol. xiii. p. 90. Tranſlat. into Engliſh.

A young lady of rank, much ſubject to rheumatic defluxions, after having ſuffered the moſt cruel and continued pain, had all her bones ſoftened in ſuch a manner, that, upon examination of her corpſe, the bones connected to the joints of the inferior and ſuperior extremities appeared to be compoſed of a kind of callous fleſh, but the other bones in firmneſs reſembled cartilages. Gagliard. Anatom. Off. p. 70. & Clariff. V. Swieten. ubi ſupra.

We have an account of a woman whoſe bones before her death were all reduced to ſoftneſs; and it is particularly remarked, that ſhe felt the pain ſevereſt in thoſe very parts of the bones where they had loſt their due degree of firmneſs moſt. At that very time too ſhe had paſſed a great deal of turbid milky urine, which depoſited a plentiful ſediment. This ſediment, upon examination, had all the qualities of the chalky plaiſter, and with a conſiderable

effervescence dissolved in distilled vinegar, or in the mineral acids. While she had this evacuation of milky urine, her pains grew milder; and sometimes she was bedrenched with copious sweats, which stained the linen like grease mixed up with chalk. The bones thus softened could be drawn out by a little force to their natural form, but bended inwards again of their own accord when left to their freedom. The cartilage remained unchanged. Histoire de la Maladie singul. Femme Mem. A de S. Lan. 1753. V. Swiet. ubi supra.

These cases are proofs of the greatest relaxation that can ever happen to any animal. For the brain and nerves are nearly in the same state they were in infancy. Then they were soft and relaxed, and sent such an aqueous nervous fluid to the bones as to keep them in a cartilaginous state.

It is necessary to observe, that the persons, in these instances, were seized with the gout, at an earlier time of life than this disease usually makes its appearance, and before many vessels, which enter the bones, had been reduced to a state of

impermeability: on the contrary, at the time when the gout uſually appears, the coheſions of the arteries in the bones are numerous, and their texture ſo firm, and the functions of the vital organs ſo much impaired, that a diſſolution of the bones can never take place. We ſhall therefore now proceed to enquire into the cauſe of this diminution in the functions of the vital organs, and to reconcile the former account of the gout with the tranſlations of the pain to the internal parts of the body, where it may be imagined, that no ſuch coheſions as we have been mentioning, can ever happen.

CHAPTER XV.

AS no heterogeneous morbid matter is the cauſe of the gout, ſo it cannot be repelled from one part of the body to another, unleſs the cohering artery of the ſecond joint be in a ſtate of ſeparation, when the pain is alleviated in the firſt. Suppoſe a perſon had the gout in his left great toe, and no where elſe, and that the pain ſhould be driven from thence by ſome external application, and that the next inſtant another pain ſhould ſeize the right great toe, yet this could not poſſibly be the effect of repulſion, in the general acceptation of the word. The artery in the right great toe was only in a ſtate of ſeparation at the ceſſation of the pain in the artery of the left foot, and was prevented from proceeding in its ſeparation, both by the current of blood which the pain had derived to the other toe, and alſo by the ſpaſm, or contraction, always brought on in the veſſels of the body by pain.

This appears to be the reaſon of a greater pain anticipating the commencement of a leſſer; a circumſtance well known to every one afflicted with this diſeaſe. The pain in the right foot would, therefore, have ſucceeded to that in the left, whether ſuch application had been made or not, but might have been delayed for ſome time longer, or, at leaſt, the mind have been diverted from attending to it.

If no artery had been in a ſtate of ſeparation in the right foot, at the ceſſation of the pain in the left, the paroxyſm muſt have terminated without any other bad conſequence. The following are a few of the many inſtances that might be quoted in ſupport of this aſſertion:

An officer of foot, by the advice of a country villager, rubbed his gouty feet with ſnow, and by this means got rid of his pain; whence, growing bolder, he ventured to walk a little way bare-footed upon the ſnow, and returned home quite free of pain, nor did the gout return a whole year after, which, at other times, ſeldom ſtayed ſo long away. Swiet. Com. Vol.

xiii. ex Pechlin. Obſ. Phyſic. Medic. L. ii. Obſ. 28. p. 280.

There are alſo two caſes mentioned by Skenſkius, where the perſons made uſe of cold ſnow-water, and were afterwards ſeized with a numbneſs, that went off by rubbing with a little rock oil, and wrapping the parts in flannel; after which the pain vaniſhed.

Hildanus relates an inſtance of a perſon in the gout, who was, for his ſpiteful and abuſive temper, very much diſliked by every body; whom another perſon, diſguiſed in the form of a frightful ſpectre, ſnatched out of bed, and taking him upon his back, walked down ſtairs, making his feet ſtrike all the way down againſt the ſteps, paying no regard in the leaſt to his terrible cries, and at laſt left him below on the floor.—The gouty man, who, before, could not ſtir a limb, got up on his legs in a hurry, ran up ſtairs, and, opening the window of his chamber, alarmed all the neighbourhood with his noiſe: however he got well, and never afterwards was ſeized with the diſtemper. Swieten Com. Vol. xiii.

Another gouty perſon, condemned to loſe his head, as they carried him out in order to be executed, re-received the moſt unexpected news of his pardon, which had ſo remarkable an effect upon him, that although he was quite exhauſted with pain, and had loſt the uſe of every limb, yet he got up on his legs immediately, and walked with remarkable quickneſs and agility, and lived many years after without having the leaſt touch of the diſorder. This caſe is preſerved in the public records. Hildam. oper. omnia. p. 993. ex V. Swiet. tom. xiii.

In the three firſt of theſe caſes, cured by the cold applications, the ſenſibility of the nerves muſt have been diminiſhed, and the veſſels of the parts ſo conſtringed by them, as to give the fibres a degree of rigidity ſufficient to reſiſt the force of the heart, and produce the ſame effect as exerciſe, which will be demonſtrated to be the moſt certain preſervative againſt the gout.

As great pain prevents the mind from feeling a leſſer, by affecting the brain in a more violent degree, ſo paſſions of the mind, which more

ſtrongly ſtrike the brain than any other preſent ſenſation, muſt neceſſarily overcome them. The moment pain abates in the body, the ſpaſm which it induced over its ſurface is taken off, and perſpiration inſtantly comes on. This was evidently the manner in which fear acted in the inſtance juſt mentioned, which prevents the return of the pain.

Joy ſuddenly diminiſhes the fluids of the body; and, like fear, makes the heart palpitate. But the quicker that organ beats above the natural ſtandard, it ſends out leſs blood into the aorta, or contracts with leſs force. The ſame effect therefore follows as from bleeding, which will always give temporary relief in inflammatory pains produced by the ſeparation of an artery. From theſe caſes it is evident, that a repulſion of the gout is often attended with no danger, and cannot always be effected. The pain in early paroxyſms might therefore be often treated with little caution. For when the veſſels in the feet are the only veſſels in the body in a ſtate of ſeparation, they might be ſo ſtrengthened by aſtringents and cold applications, as to enable

them to reſiſt the action of the heart many years longer. The difficulty conſiſts in diſcerning whither any other part of the body may be liable to ſuffer from ſuch treatment.

In aged conſtitutions, where any of the noble organs have previouſly manifeſted a diſpoſition to diſeaſe, the worſt conſequences may follow aſtringent applications; for although there is no morbid matter circulating with their fluids, and that what does not exiſt, cannot poſſibly be repelled; yet it is equally dangerous to attempt the uſe of repelling medicines as if ſuch matter did actually exiſt.

Hoffman relates the hiſtory of a man upwards of ſixty years of age, who, by applying an empirical aſtringent to the feet, alleviated the pain; but the next day fell into the moſt grievous hiccups, anxiety, reſtleſſneſs, gripings, conſtipation of the bowels, deliquium, palſy of the muſcles of his neck, apoplexy and death. But this very man had, for many years before, been troubled with convulſive and cholicky cramps

in his bowels, which obliged him to frequent the bath of Carlesbad every year. The relaxation was so universal, and the functions of his organs of digestion so imperfect, that the food continually acquired an offensive quality, and excited the symptoms.

Vir sexagenario major, sanguineo cholericus, sanguine & succis plenus, habitus corporis robusti animique ad iram valde proclivis, per complures annos doloribus convulsivis, colicis spasticis, nec non podagricis misere divexabatur : quorum tamen malorum solamen, in usu Carolinarum singulis annis adhibitarum, nunquam non præsentissimum invenit, &c. Hof. Med. Rational. tom. iv. pars 2. p. 536.

Here was evidently a proximity of sensibility between the bowels and the feet ; whenever the waters of Carlesbad carried off their impurities, and restored some degree of vigor to the patient, he was relieved from his cholics, and then his feet would suffer greater pain. But whenever the *primae viae* relapsed into their former weakness, the impurities of indigested foods again brought on all his former complaints, which o-

bliged him to return to the mineral waters, as the only means of preſerving his life.

All theſe grievous ſymptoms, proceeding from the uſe of aſtringent powder, attend alſo inflammations of the colon, as well as other parts of the canal, whether the inflammation be firſt produced from pent up wind, or a relaxation of the cohering arteries in the coats of the inteſtines. And as the colon had, for many years, been diſpoſed to inflammation, it was only acting conſiſtently with the rule nature always obſerves; for if a cohering artery, in any other part of the body, had been farther advanced in a ſtate of ſeparation than the inteſtinal canal, the pain would have commenced in that, as painful affections in the extremities often preſerve the whole machine from certain deſtruction.

Muſgrave relates the caſe of a man before he was fifty years of age, who, in the violent heat of a paroxyſm of the gout in his feet, ſuddenly plunged them into cold water: this allayed

the pain and tumour in his feet, but a vomiting and pain of the bowels ſucceeded, which ſymptoms were aggravated by his ſwallowing large quantities of fruit to remove the heat of his viſcera. He continued in this ſituation, neglecting medicine for ſome months, and during the whole time, was, more or leſs, afflicted in the ſame manner, till, at laſt, it was out of the power of phyſic to give him any relief.

This man's gout was not only hereditary, but he had alſo been in an infirm ſtate of health for a conſiderable time. His complaints, according to the hiſtory of the caſe, aroſe from an inordinate relaxation of the ſtomach. For he had a very languid appetite; and his digeſtive powers were much weakened, ſo that his body began to waſte away for want of proper nouriſhment. *Appetitum habuit admodum lanquentem, coctionem imminutam; unde ali deſinere coepit, & inopia conſumi.* De Affect. Vent. Hiſt. 2.

Theſe two caſes are adduced, becauſe they appear ſtrongly to favour the doctrine of repul-

ſion. It is very probable that this notion was firſt founded on theſe ſort of appearances of the diſeaſe; and nothing could be more ſpecious, or more conſiſtent with that ſyſtem, than the ſucceſſion of pain from one part to another.

CHAPTER XVI.

AS the cauſe of the gout in the extremities proceeds from a ceſſation or interruption in the motions of theſe parts, it may be imagined that the diſeaſe ought never to appear in other parts of the body, where no ſuch interruption ever happens. The lungs, liver, ſpleen, ſtomach, and inteſtines, are ſometimes ſubject to the gout, and yet all theſe organs are kept in perpetual motion, by the action of the lungs, and the execution of their own functions. If any arteries, therefore, ever cohered in any of them, they ſhould be always preſerved in a ſtate of coheſion.

Although all theſe organs enjoy a perpetual motion, yet this motion is never altogether uni-

form when the body is awake. Reſpiration is not ſo frequently required, or performed, by a body at reſt, as in exerciſe. The vital organs of a gouty conſtitution will therefore ſuffer the ſame conſequences from indolent motions as the ſolids of the other parts of the body.

If there are cohering arteries in any of the vital organs, they will, however, be leſs liable to ſeparate than thoſe in the extremities of the body. This proceeds from the greater uniformity of the motions of theſe parts. But whenever any of their veſſels do tend to ſeparate, the whole body is then in imminent danger of diſſolution.

When theſe organs are in the greateſt ſtate of relaxation, accidents of this kind moſt generally happen. Hence they only appear in old age, and even ſeldom at that period; for the arthritic body is deſtroyed in a more lingering and tedious manner by a gradual diminution in the functions of the vital organs, from the univerſal prevalency of relaxation.

This relaxation is firſt felt by the vital or ſpontaneous organs, which are endowed with the greateſt ſenſibility. Hence proceed the affections of the ſtomach, which almoſt always introduce a paroxyſm of the gout.

Theſe affections have been hitherto ſuppoſed to be of very little conſequence, as the pain of the paroxyſm always carried them off if the perſon was young.

Although the pain of a paroxyſm in the extremities removes the morbid affections of the ſtomach in the firſt fits of the gout; yet ſickneſs and other affections of that organ frequently ſeduces the arthritic pain from the extremities, when the body grows old in the diſeaſe.

Sickneſs wonderfully deſtroys the ſenſibility of the nerves, and diminiſhes the force of the heart in a greater degree than any other affection of the body. Now, the pain in the extremities, being occaſioned by the ſenſibility of the nerves

in the lacerated artery, which the force of the heart had torn open, muſt neceſſarily vaniſh, when both that ſenſibility, and the force which occaſioned it, is removed. The more intenſe, therefore, the ſickneſs is, the heart will beat the weaker. The more languid and feeble that organ contracts, the ſlower is the motion of the blood. The ſlower the blood runs, it impells the ſeparating arteries with leſs force: ſo that the tenſion to which the nerves were reduced before the ſickneſs came on, being taken off, the pain inſtantly abates.

A lady of ſixty, who had been grievouſly afflicted with ſharp paroxyſms in the extremities, was alſo frequently ſeized with ſudden ſickneſs and vomiting; and notwithſtanding her pains in the feet appear to have been more ſevere than thoſe to which Sydenham refers, yet the ſickneſs ſo weakened the heart, as to produce an inſtant alleviation of them; ſhe was therefore always rejoiced when the ſickneſs came on, as it was much more tolerable than the pains in her extremities. It ended, however, always in vomiting, which no

ſooner ceaſed than her former pains inſtantly returned.

The pain of the extremities, in theſe caſes, has ſo much increaſed the ſenſibility of the nerves of the whole body, but eſpecially thoſe of the ſtomach, which are the moſt ſuſceptible of irritation, that they cannot ſuffer the remains of the food which happens to be in the ſtomach at that time. It is therefore irritated by a ſtimulus, which would at no other time affect it. For it is the ſame thing, whether the ſenſation of the ſtomach be doubly acute, or the matter which is in it be twice as acrimonious.

No ſooner is the offending matter thrown up, than, in general, the ſickneſs vaniſhes. The ſickneſs being removed, the pain returns to the extremities, and the ſtomach continues eaſy till a freſh collection of matter be again formed.

The act of digeſtion is alſo ſo troubleſome, and a greater quantity of air is let looſe from

the food than is ever found in the healthy ſtate of the ſtomach. This air being rarefied by the heat of the body, diſtends the ſtomach beyond its natural dimenſions; which is ſufficiently manifeſted by an obtuſe cold weighty ſenſation, attended with more uneaſineſs than pain, and infinitely more grievous and diſtreſſing than any other complaint which ever afflicts the body.

Animadvertendum eſt, quod in alio morbo vix contingere vidi, ubi hanc partem corripuit morbus, quaſi torpore quodam & frigoris ſenſu mirum in modum affici ventriculum; ita ut vinum ſit pro aqua, & liquores calidiſſimos quales ſunt ſpiritus quos vocant ex vino eliciti, is expectat & facile feret. Mead. Monit. & Præcept. Medic.

The gout has then been ſuppoſed to be in the ſtomach; but all theſe ſymptoms only ariſe from the rarefaction of the air, which the weakneſs of the ſtomach is unable to involve in the food. The ſudden relief hot aromatics afford in this

ſtate of that organ, is a proof that its powers are then languid, ſince they act by ſtimulating its coats; for they are no ſooner received into the ſtomach, than its coats are ſuddenly brought nearer, and the air is forced out at its upper orifice, by which the patient is inſtantly relieved.

If the arthritic pain happens to be in the extremities, when this tumefaction of the ſtomach is brought on, it ſuddenly leaves them, for the reaſons already given. And when the contractile power of the ſtomach has been ſo invigorated by aromatics, or cold water, as to expel the air that occaſioned the uneaſineſs, the force of the heart is again reſtored, and the pain as inſtantly commences in the extremities.

But the diſtenſion is ſometimes ſo great, and the tone of that organ ſo far loſt, as not to be affected by any ſtimulus. The ſympathy the heart always manifeſts for the ſtomach, is now ſo remarkable as to occaſion a deliquium, for it contracts ſo weakly as not to furniſh the brain with a ſufficient quantity of blood for the ſupply

of nervous fluid. The whole body is then in danger of being involved in a general calamity, by this apparently trivial accident happening to a noble part of it.

The grumbling tranſitory inflations, and griping pains, which torture the inteſtines, proceed almoſt from the ſame cauſe, only the air deſcending with the imperfect digeſtions, excites greater pain in them, as it cannot ſo eaſily eſcape the numerous convolutions of the canal.

It may be proper to obſerve, that inflammations happen much oftener in the great, than in the ſmall inteſtines. This appears to proceed from the feces, which acquire an indurated ſtate in them. Theſe congeſtions are known to be very long retained in gouty habits; ſo that the inteſtines are naturally diſtended, and the ſmall veſſels of their coats compreſſed: this will neceſſarily ſubject them to the ſame conſequences as the other parts where the arteries cohere; ſo that when the relaxation becomes general, and the

functions of the ſtomach are ſo much debilitated as to produce imperfect digeſtions, the inteſtines are ſtimulated by the very ſubſtance which ought to remain in them for the nutrition of the body; and the food, inſtead of entering the lacteals, is hurried through the bowels, brings on frequent looſe ſtools, and the former coſtive habit is reverſed. No indurated feces now remain in the canal, ſo that no farther compreſſion can take place. The arteries that were formerly compreſſed, will now be liable to be ſeparated, and excite an inflammation in the coats of the inteſtines. This inflammation, is, therefore, very different from that produced by pent up air in the bowels, although the heat attending it ſo much rarefies the air at the ſame time in that part, as to render it often difficult to determine whether the pain proceeds from one cauſe or the other.

The ſtomach and ſmall inteſtines are leſs ſubject to inflammation perhaps, than any part of the body; becauſe they are continually fo-

mented by the thin foods, which prevents coheſion ſo eaſily forming in their coats. Accordingly we ſeldom have any other complaint in them than what proceeds from the irritation of the ſubſtance taken in. Enormous diſtenſions of the ſtomach will, however, affect the liver and ſpleen, and eaſily impede the circulation, naturally very ſlow, in their veſſels. Hence a foundation is laid for morbid affections of theſe organs when the manner of living is obliged to be changed for a more penurious diet, which either the inclination of the ſtomach, or the exigencies of the conſtitution require.

When the ſtomach and inteſtines are in ſuch a ſtate of morbid relaxation, they might be much relieved by a ſharp ſpontaneous pain in the extremities; but, in this ſtage of the diſeaſe, no ſuch circumſtance is ever to be expected; for the great reſtraint which affections of theſe organs lays on the power of the heart, prevents the blood from ſtriking a coheſion in the extremities with ſufficient force.

When this reſtraint is a little removed, and the heart permitted to contract with greater energy, pain appears then to be diffuſed over the various joints of the body. Theſe pains, however, are all quickly checked, by the return of the ſickneſs, and tranſitory pains in the inteſtines. Theſe ſymptoms are excited by the vitiated remains of the foods; for the functions of the ſtomach are ſo impaired, as to be unable to effect one ſalutary digeſtion. Whatever, therefore, is taken in, quickly degenerates into a putrid or aceſcent ſtate.

Paroxyſmi nunc ægrum quoad dolorem clementius tractant, ac loco doloris conſueti, ægritudo quædam cum dolore ventris, laſſitudo ſpontanea, quandoque etiam propenſio ad diarrhœam ſuperveniunt. Hæc ſymptomata, dum vigent, artuum dolorem leniunt, quæ pariter evaneſcunt, quoties articulos dolor fatigat: atque ita nunc dolore, nunc ægritudine quaſi alternatim laceſſente, paroxyſmus longas moras nectit. Syd. Tract. de Podagra.

After the arthritic conſtitution has been long haraſſed by ſuch alternate affections in the various parts of his body, he, at laſt, ſubmits to quit the little life which the diſeaſe had left him, and eaſily expires.

The CURE.

CHAPTER XVII.

WE ſhall begin this part of the treatiſe by inveſtigating the conſequences of pain attending the ſeparation of a cohering artery, becauſe that very pain is the only remedy which nature employs againſt the general relaxation that prevails in this diſeaſe.

Arthritic pain increaſes the motion of the nervous fluid, the heat and ſenſibility of the body, and the momentum of the blood.

As the nerves of an arthritic conſtitution are relaxed and diſtended, and contain a greater quantity of fluid than thoſe of a man in health, and as this fluid has alſo a ſlower motion, no-

thing can act ſo efficaciouſly in checking this morbid diſpoſition of the nerves as pain; for pain, by the ſpaſm it produces, contracts the capacity of the nerves, and makes them more firm. It alſo increaſes the ſenſibility of the abſorbent veſſels, and thereby enables them more readily to take up the fluids depoſited too plentifully in the cellular membrane.

No ſooner are theſe redundant fluids taken up from the cellular membrane, and tranſmitted into the courſe of circulation, than they are quickly diſſipated by the increaſed heat of the body.

Increaſed heat diſſipates the moſt fluid parts from our blood; that is to ſay, the moſt ſpirituous, watery, ſubtile, ſaline, and oily particles, while it dries, condenſes and inſpiſſates the reſt, into an impervious indiſſolvible matter; it ſets at liberty the ſaline and oily parts, attenuates and renders them more acrid, exhales, and puts them in motion; hence it grinds away, and breaks the ſmalleſt veſſels, dries up the fibres, and renders them rigid and contracted.

Boerh. Aph. Traſlat. into Engliſh. V. vi. p. 218. Aph. 689.

Arthritic pain compells the heart to more frequent and powerful contractions, and gives a greater denſity to the blood. The permeable arteries will be, therefore, ſtruck with greater force, and be rendered more compact and ſtrong.

The nerves of a gouty man are, therefore, ſtronger and firmer after pain than before it. Hence the body is enlivened and invigorated when recovered from a paroxyſm of the gout. The redundant fluids being alſo diſſipated, the ſolids cannot be ſo liable to fall into their former relaxation.

If all the arteries of the body, except thoſe in which the pain is ſeated, were permeable, the advantages of the arthritic paroxyſm would evidently be permanent to a relaxed conſtitution, but as in theſe habits many arteries, in every joint, are in a ſtate of coheſion, each of theſe coheſions muſt neceſſarily be an impedi-

ment to the motion of the blood. When the momentum of that fluid is increaſed, the coheſions will be acted upon with greater force, and diſpoſed to a more ſpeedy ſeparation. One paroxyſm of the gout, therefore, tends to bring on another; or, a ſecond paroxyſm is haſtened by the effects of the firſt.

If arthritic pain is excited by the ſeparation of a cohering artery in a muſcle, the nervous fluid is accelerated in the muſcle, and the muſcle contracts. If the deſtruction of the artery is tediouſly effected, the ſucceeding inflammation diſſipates the fluid depoſited in the cells between the fibres of the muſcle, and the fibres grow together; the muſcle being at the ſame time in a ſtate of contraction, muſt remain in that ſtate, and the motion of the joint be for ever loſt. Rigid contractions, or extenſions, from this cauſe, are moſt liable to happen to thoſe whoſe joints have formerly been moſt exerciſed.

The motion of a joint is alſo frequently deſtroyed, when the pain is either ſeated in the ligaments connecting the heads of the bones, or

in the articulations themſelves. When the relaxation is ſo prevalent, as even to reach the cohering arteries in the cavities of the joints, the earthy fluid iſſuing from the extremities of the ruptured arteries cannot be taken up, but is gradually inſpiſſated by the heat of the part to a chalky concretion, which frequently diſlocates or diſtorts the joints. Sometimes, however, theſe concretions are attended with little inconvenience, and produce no ſuch effect.

It therefore appears, that arthritic pain is attended with fatal conſequences to the part where it fixes, diſpoſes other cohering arteries in the body to ſeparate, and lays the foundation for a quicker return of future paroxyſms: for theſe reaſons it ſhould always be alleviated, if poſſible, except when it appears to prevent the diſeaſe from falling on any of the vital organs.

This only happens in aged gouts, when the nervous fluid is in danger of ſtagnating, and rendering many parts of the body paralytic, and when the vital organs are ſo weakened as to be unable to perform their uſual functions without the ſtimulus which pain gives to the nerves; for

relaxation, being almoſt the only cauſe of the affections of theſe organs, is more quickly counteracted by pain than by any other means; ſo that in this reſpect it may be juſtly denominated *nature's moſt ſevere remedy*, as it deſtroys one part of the body, although it ſaves the reſt from deſtruction. *Namque hoc in morbo dolor amariſſimum eſt naturae pharmacum, qui quo vehementior eſt, eo citius praeterlabitur paroxyſmus, atque inſuper & longior erit intermiſſio & magis perfecta; & vice verſa.* Sydenh. de Podag.

It may be here obſerved, that a ſharp and ſhort fit of the gout is not the cauſe, but only the indication of long intervals between the paroxyſms. For larger arteries are concerned in the firſt paroxyſm than the ſecond; theſe are therefore ſooner and more violently deſtroyed. But the prevailing relaxation is evidently leſs in the firſt than in any future paroxyſm; the body has therefore a better chance of being exempt from a quick return of the diſeaſe.

In aged gouts the pain cannot be ſo violent as at an earlier time of life; for the arteries to be

ſeparated have leis diameters, and the blood which impels them has leſs momentum.

Although ſharp pain can never be expected in an aged arthritic conſtitution, yet it is never ſo much to be deſired as at that period of life. This is ſufficiently apparent from the dangerous ſymptoms which frequently come on upon the ceſſation of theſe aged pains, gentle as they are; for no ſooner is the pain of the feet or hands, for inſtance, abated, than the ſtomach is affected with nauſea and ſickneſs, the bowels with pain, the intellectual faculties are weakened, dimneſs of the eyes, a total proſtration of ſtrength comes on, and the patient feels a propenſity to remain in whatever ſituation he is placed, and immediately afterwards deſires to change that ſituation for another that he thinks will be more eaſy. Theſe ſymptoms are accompanied with wiſhing for death, or a return of pain in the extremities: this in a moment diſpels all the deſponding thoughts of the patient, and quickens the motion of the nervous fluid, which the nerves were unable to propel, without the aſſiſtance of that ſtimulus.

Conſtitutions of this kind are in perpetual danger of being deſtroyed during the cold months of the year; for the check which cold air gives to perſpiration, favours ſo much the natural tendency of the ſolids to retain the nervous and aqueous fluids of the body, that they are ſoon overwhelmed by theſe fluids, and pain becomes abſolutely neceſſary to evacuate them. In the warm months of ſummer the ſpaſm is removed from the exhaling veſſels of the ſkin, and perſpiration being more copious, theſe effects are prevented. Hence a gouty perſon lives free from pain, and recovers his ſtrength in this ſeaſon.

No ſooner, however, does autumn return, than the body ſoon diſcovers the change of the atmoſphere; for a check being given to perſpiration, the veſſels are again diſtended with the fluids, and coheſions ſeparated in ſome part of the body. If no veſſel in the extremities is in a ſtate of ſeparation, the vital organs are afflicted with many of the ſymptoms already mentioned, which never diſappear until pain commences in ſome part of the body. Life, in ſuch a ſituation, depends on the return of pain; for the great ſick-

neſs of the ſtomach, ſo far deſtroys the force of the heart, that it is unable to ſend a ſufficient ſupply of blood to the brain, for the purpoſes of nervous ſecretion. From this additional cauſe the force of the heart muſt be farther weakened, as an interruption of the influx of the nervous fluid into that organ, ſtops its motion altogether. Now, as the pain proceeds from a ſeparation of an artery, and this from the power of the heart, a ſeparation can never be effected when this power is diminiſhed. The affections of the ſtomach, being, therefore, the original cauſe of the languid contraction of the heart, ought firſt to be removed by every means capable of producing a grateful ſtimulus upon its coats. That organ being nearly paralytic, it muſt be ſtrongly ſtimulated before its ſenſibility is recovered. This is no ſooner effected than its contractions are reſtored, and the rarefied air, which had aggravated its complaints, expelled; the heart recovers its ſtrength, and the ſeparation of the cohering arteries in the extremities is renewed. The pain is, however, ſo inconſiderable, as to be unable to complete the deſtruction of the arteries, before it is again withdrawn from them by

the irritation of the remains of indigeſted foods acting on the nerves of the ſtomach and inteſtines. Theſe remains are of ſuch a poiſonous quality as to vitiate the ſenſation of the nerves of theſe organs in the former manner. But when the relaxation is ſo prevalent in them, it is evident that the body is near its diſſolution; for the repeated checks the vigour of the heart receives from theſe affections, prevents that organ from exciting pain in the extremities. The nerves, at the ſame time, are in ſuch a ſtate of relaxation, that they cannot propel their fluid without pain. If pain, therefore, cannot be raiſed in the extremities, the nervous fluid muſt ſtagnate, and the body periſh.

No diſeaſe has been left ſo much to nature as the gout; although it is now evident none requires ſo much aſſiſtance from art. In the firſt paroxyſms we have violent pains to correct an incipient relaxation; and in old age, when the relaxation is more univerſally prevalent, the pains are infinitely leſs ſevere. We even obſerve, that nature herſelf gives a check to theſe indolent pains, by indiſpoſitions produced in the

internal organs, although it appears that theſe very pains are the beſt efforts which can be exerted to preſerve the exiſtence of the machine.

Nature attacks a joint of the great toe in the firſt fits of the gout. She does this becauſe there are cohering arteries in a more relaxed ſtate in that particular joint, than any where elſe in the body. If a gouty conſtitution receives any accidental contuſion from external cauſe, the diſeaſe is alſo obſerved to frequent this injured part.

It muſt therefore be allowed, that nature is an enemy to arthritic conſtitutions, as ſhe always attacks the weakeſt parts.

If it be urged, however, that her attempts are benevolent, and that ſhe endeavours to correct the relaxation, it will ſtill be apparent that ſhe carries her attempts too far, and changes the relaxation into a more dangerous diſeaſe. This is done by inducing an inflammation on a

relaxed extremity, and bringing it, by the vehemence of her operation, to a ſtate of rigidity.

Nature, therefore, inſtead of being the phyſician, is an empiric in the gout; for ſhe acts without theory or reaſon, and only does good to ſome parts of the body, in conſequence of great injury to others.

CHAPTER XVIII.

WHEN oiled ſilk is applied to any part of the ſkin, a very copious perſpiration is found on the part it covers. When applied to an inflamed and painful ſkin, the perſpiration is ſtill more copious. If to an inflamed, painful, and ſwelled part, the perſpiration is ſtill greater than where there is only an inflammation without ſwelling. Laſtly, If the oiled ſilk is applied to the ſwelling, which ſucceeds a fit of the arthritic pain, the perſpiration is exceed-

ing great, and more abundant than in any of the former inſtances.

The application of the oiled ſilk, from repeated obſervations, is generally followed by a perſpiration proportioned to the elevation of the tumour.

If the oiled ſilk is applied to a gouty pain in any of the joints, it frequently aggravates it. The cauſe of this aggravation will eaſily appear, if it is remembered, that the pain is occaſioned by lacerations of arteries at different depths from the ſkin.

The paroxyſm may be produced by arteries ſeated in the ſheaths of the tendons, and in the ligaments connecting the bones; in thoſe which enter the cartilages and bones, which ſupply the cavity of the joints, or in any of the arteries between the marrow and ſkin.

When the pain is very intenſe, the part exceedingly red, and the redneſs nicely limit-

ed, we may ſuſpect the paroxyſm to be ſeated in the cutaneous arteries. This may be ſtill farther aſcertained by the ſenſations of the patient, who will generally be able to judge whether he thinks the pain is ſeated in the ſkin or not. If it ſhould be in the ſkin, and the oiled ſilk be applied over it, the contraction produced by the air, on the mouths of the cutaneous veſſels, is removed, their diameters conſequently enlarged, and a greater quantity of blood is tranſmitted through them in a given time. The fluids being directed to the ſkin, with greater velocity, muſt neceſſarily impel the cohering arteries with greater force in endeavouring to get out, by which the laceration is more expeditiouſly carried on, the pain increaſed, and the paroxyſm ſooner terminated; for the nerves cannot ſuffer a duration of exquiſite pain.

If any perſons have reſolution to endure this increaſe of pain, it is evident they will ſoon get rid of the fit, becauſe the arteries will be ſooner deſtroyed. But I have hitherto obſerved, that

the pain is ſo much aggravated in theſe caſes, by the application of oiled ſilk, that it has prevented ſeveral people from continuing it.

As the oiled ſilk exaſperates the pain of the gout, when the arteries which produce it are ſeated in the ſkin, on the contrary, the good effects of this application are ſoon manifeſted, when the ſeparating arteries are nearer the bone.

Alleviation of pain, conſequent on the application of the oiled ſilk, in theſe caſes, proceeds from the derivation of the fluids to the ſuperficial arteries, where they are evacuated by perſpiration; for the motion of the blood is ſo impeded in the parts below, that it is eaſily diverted into the cutaneous arteries, when the reſiſtance from the cold air is taken off. As the exit of the fluids through the ſuperficial veſſels, is accelerated, their motion is diminiſhed in the deeper branches directed to the ſeat of the pain. The coats of theſe arteries will, therefore, be leſs forcibly impelled by the heart, and will gradually

relax. The moment the relaxation takes place in the ſeparating arteries, the tenſion on the ſkin will be removed, and perſpiration will be abundant. The ſpaſm which had ſpread over the ſurface of the body, alſo goes off, and perſpiration is often univerſal.

It may be obſerved, that the gout is ſeldom produced by a ſeparating artery in the ſkin; for the ſkin is only ſubject to great compreſſure in ſome few parts of the body. Cutaneous arteries can therefore ſeldom be brought to cohere; whereas the arteries of the ligaments, tendons, &c. are compreſſed in every joint of conſiderable motion, and conſequently it is evident the application of the oiled ſilk muſt, in general, alleviate pain.

The manner in which the oiled ſilk acts is ſimple, and eaſily accounted for. Denſity excludes the cold air from the skin; and therefore makes the part it covers inſtantly warmer, and perſpiration comes on.

The pain begins to abate when the air between the oiled ſilk and skin is ſufficiently impregnated with the warm perſpirable matter exhaling from the part; for, in conſequence of this warmth and moiſture, the nerves, of the part affected, which were in a ſtate of extenſion, are relaxed, and their ſenſibility diminiſhed. When the nerves are relaxed, the nervous fluid cannot be propelled with ſufficient velocity to excite inflammatory and painful heat. The hot ſenſation, therefore, of the inflamed part, ſubſides, and pain ceaſes.

The effect, then, of the warm moiſt air, retained by the oiled ſilk, is ſimilar to that of an opiate; and it is this genial moiſture which gives the ſudden relief that is often experienced from their application.

A gentleman of fifty had a ſevere fit of the gout in one of his feet. The pain was deep ſeated, and the apparent inflammation inconſiderable. The foot was wrapped up in fine

wool, and as high as the ankle. A piece of oiled ſilk covered the wool, and was cloſely confined over it.

No ſooner was his leg at reſt, than his pains vaniſhed. This effect was ſo ſudden, that it was ſcarce poſſible to attribute it to the application; the paroxyſm was, therefore, ſuppoſed to have terminated of its own accord. But as the patient doubted whether this was really the caſe, he reſolved to make the experiment. He therefore removed the wool and oiled ſilk, and his pains inſtantly returned. The applications were then renewed, and he was inſtantly relieved as before. The experiment was repeated a third time; and he was at laſt convinced, that the application of the oiled ſilk was the abſolute and ſole cauſe of the relief.

Let the wool be applied in ever ſo great a quantity over the part, it will always be obſerved, that the perſpiration flies off to the oiled ſilk, and hangs in condenſed drops on its internal ſurface.

The leſs volatile part of the perſpiration remains in cloſer contact with the skin. I have twice obſerved it of the conſiſtence of a thin jelly, depoſited in the furrows of the hollow of the foot and heel. When the paroxyſm terminates of its own accord, without the aſſiſtance of the oiled ſilk, innumerable quantities of ſcales may be rubbed off the ſkin above the pained part. Theſe appear to be the product of the nervous fluid, thickened by the heat of the inflammation, which the irritation had derived in greater quantity to that part than to any other.

The oiled ſilk is alſo a certain preſervative againſt the formation of chalk ſtones in the parts of the body it is applied to; and if they are already formed, no application is ſo very efficacious in diſſolving them. Their diſſolution is effected by the great afflux of the aqueous part of the blood which the oiled ſilk induces to the cells in which they are depoſited. Theſe aqueous fluids gradually act as a menſtruum upon theſe terreſtrious concretions, and ſo much

relax the cellular membrane which ſurrounds them, as to permit the ſtones in this ſoluble ſtate to ouze, and eſcape into the neighbouring parts which are in a ſtate of leſs compreſſion. The diſſolved concretions are there taken up by the abſorbing veins, and either carried back into the general courſe of circulation, or thrown out by cutaneous exudations.

The oiled ſilk has been alſo uſed in relaxing the veſſels of the feet, to bring on a fit of the gout, when it was ſuppoſed to be delayed either by the reſiſtance the coheſions made to ſeparation, or by the imbecillity of the vital organs from general relaxation. Theſe have been denominated unformed gouts.

The oiled ſilk being applied to the feet of two perſons in this ſituation, of a lax and moiſt habit, produced a conſiderable perſpiration. This was followed by an abatement of their moſt urgent ſymptoms, a great langour and depreſſion of ſpirit; the heart beat with more vigour, and

the blood was impelled with a greater momentum. It was alſo more particularly directed to the feet, from the cauſes already mentioned. In a few days, this increaſe to the blood's force began a ſeparation of an artery at the very time the oiled ſilk covered the feet, which continued for ſeveral days, with ſharp pain, and then vaniſhed.

The oiled ſilk has not only brought on a fit of the gout, when pain was required, but likewiſe removed the arthritic pain from one part of the body to another.

A lady of ſixty years of age was much afflicted with the gout in various parts of the body, but had no pains in her feet for the preceding ten years. In February 1766 ſhe was ſeized with an excruciating pain in her cheek, with great inflammation over one ſide of her face. This had continued two days when the oiled ſilk was applied to both her feet. The firſt night of its application, a ſharp pain ſeized

one of her great toes, and from that moment the former pain left her. The pain in her toe continued two hours, and then abated : ſhe afterwards ſlept ; and in the morning had no complaint whatſoever.

From what has been ſaid it appears, that the oiled ſilk alleviates the pain of a paroxyſm of the gout, by diverting the courſe of circulation from the artery that is the cauſe of the pain. However, as it prevents the deſtruction of the artery, the ſame artery is always again liable to be affected, whenever the redundancy of fluids, which firſt diſpoſed it to ſeparate, is regenerated. The oiled ſilk ſhould therefore be continued for ſome days after the pain is gone, to procure a copious evacuation of the fluids, by which the next paroxyſm will be longer deferred.

The oiled ſilk has been accuſed of relaxing too much, and bringing on a weakneſs in the joint; but granting this to be the caſe, it will readily be allowed, that a relaxed joint is eaſier

cured than a ſtiff one. The laſt is always to be apprehended from the violence of an arthritic inflammation, that terminates of its own accord, and is more certainly prevented by this application than any other.

CHAPTER XIX.

THE moxa, or down of mugwort, is applied in the form of a cone, with its baſe to the part where the pain firſt begins in the gout. The moxa is fired at the top, and gradually burns down to the ſkin. The ſkin is cauterized; but if the pain of the gout is not taken off by the firſt incineration, the burning is to be renewed to the fourth time, or till the arthritic pain is removed, and the perſon can ſet his foot boldly to the ground.

The following is the hiſtory of the operation given us by the illuſtrious Sir William Temple, which was performed upon himſelf, in the fifth day of the paroxyſm, when the violence of the pain had already abated, and there only remained a ſwelling and ſoreneſs, with inability of motion.

Upon the firſt burning I found the ſkin ſhrink all round the place, and whether the greater pain of the fire had taken away the ſenſe of a ſmaller or no, I could not tell; but I thought it leſs than it was. I burnt it the ſecond time, and upon it obſerved the ſkin about it to ſhrink, and the ſwelling to flat yet more than at firſt. I began to move my toe, which I had not done before; but I found ſome remainders of pain. I burnt it the third time, and obſerved ſtill the ſame effects without, but a much greater within; for I ſtirred the joint ſeveral times with eaſe; and, growing bolder, I ſet my foot to the ground without any pain at all. After that, I had a bruiſed clove of garlick laid to the place that was burnt, and covered with a large piece of diapalma to keep it fixed there; and when this was done, feeling no more pain, and treading ſtill bolder and firmer upon it, I cut a ſlipper to let in my foot, ſwelled as it was, and walked half a dozen turns about the room, without any pain or trouble, and much to the ſurprize of thoſe that were about me, as well as to my own.

For the pain of the burning itſelf, the firſt time it is ſharp; ſo that a man may be allowed to complain; I reſolved I would not, but that I would count to a certain number, as the beſt meaſure how long it laſted. I told ſix-ſcore and four, as faſt as I could; and when the fire of the moxa was out, all pain of burning was over. The ſecond time was not near ſo ſharp as the firſt; and the third a great deal leſs than the ſecond. The wound was not raw as I expected, but looked only ſcorched and black; and I had rather endure the whole trouble of the operation, than half a quarter of an hour's pain in the degree I felt it the firſt whole night.

After twenty-four hours I had it opened, and found a great bliſter drawn by the garlick, which I uſed no more, but had the bliſter cut, which run a good deal of water, but filled again by the next night; and this continued for three days, with only a plaiſter of diapalma upon it; after which time the bliſter dried up, and left a ſore about as big as a two-pence, which healed, and went away in about a week's time longer; but I continued to walk every day, and without the leaſt return of pain, the ſwell-

ing ſtill growing leſs, though it were near ſix weeks before it was wholly gone. I favoured it all this while more than I needed, upon the common opinion, that walking too much might draw down the humour; which I have ſince had reaſon to conclude a great miſtake; and that if I had walked as much as I could from the firſt day the pain left me, the ſwelling might have left me too in a much leſs time. Sir Will. Temple's Miſcell. Vol. I. p. 141.

I continued well till this ſpring, 1667, *when about the end of March, feeling again the ſame pain, and in the ſame joint, but of the firſt foot; and finding it grow violent, I immediately burnt it, and felt no more after the third time; was never off my legs, nor kept my chamber a day. In theſe laſt experiments I omitted the application of garlick, and contented myſelf only with a plaiſter of diapalma upon the place that was burnt, which cruſted and healed in a very few days, and without any trouble.* P. 144.

" *A certain clergyman, who inherited this diſtemper from his father and grandfather, as he was*

laid up with a very ſevere fit in Batavia, the metropolis of the Dutch ſettlement of that name in India, an Indian woman not only promiſed to give him eaſe, but alſo to cure this diſtemper entirely, provided he would undergo only a gentle burning. He was averſe to it at firſt, but upon his pains increaſing, he at laſt conſented. This woman then taking a bit of the moxa, no bigger than a pea, and forming it into the ſhape of a cone, applied the baſe to the place where the pain was chiefly felt, then ſet fire to the apex of this little cone, with a ſmall match of an aromatic twig. Part of the moxa was converted into aſhes, and part remained adhering to the ſkin, which the humidity that iſſued from the part had hindered from burning. This burning with the moxa was ſeveral times repeated, though, for the moſt part, it is only performed thrice; and the whole operation was finiſhed in half an hour, though he had this remedy applied to ſeveral places at once. He ſaid he could obſerve by his ſight, as well as feeling, the quickeſt motion of the humours juſt underneath the ſkin, and that all his pains abated immediately. In the mean time he allows, that the part affected threw out a rank ſtinking vapour; and

that ſoon after he fell into a continued ſound ſleep, which he had not enjoyed for ſeveral weeks before. Next day, when he waked, he felt nothing of the diſorder remaining, but a ſwelling in the feet; and this alſo went very ſoon off. Miſcel. Curioſ. Decur. 1. An. 6 & 7. pag. 319. & V. Swiet. Com. V. xiii. p. 221.

From theſe caſes it is evident, that the artery is deſtroyed by the cauſtic before the pain is alleviated. The repetition of the burnings manifeſt the ſituation of the veſſel or veſſels. If one is ſufficient, the artery muſt be ſuperficial. If it requires two or three burnings, it muſt be deeper ſeated, and ſo on. However, the cauſtic might eaſily be ſuppoſed to have deſtroyed all the veſſels to the ligament in the joint of the great toe, at four or five burnings, ſo that it was impoſſible the arthritic pain ſhould continue when the nerves, which had been the cauſe of it, were deſtroyed. When the arthritic pain is, therefore, nicely limited, and circumſcribed to a ſmall circumference, as is frequently the caſe in many paroxyſms of the gout, the ſeparating artery may be eaſily deſtroyed by this inflammable cone,

and the operation followed by the moſt happy ſucceſs; for it is excellently calculated to cure the early fits of the gout, and to anticipate all the bad effects which a duration of pain entails upon the joints. It ought, for theſe reaſons, to be more generally uſed in this country, than it has ever hitherto been.

CHAPTER XX.

AS opiates diminiſh the ſenſibility of the nerves, and the motion of their fluid, they are peculiarly ſerviceable in pain where the ſenſibility is too acute, and the motion of the fluid too much accelerated. A termination of pain, by whatever means it may be effected, is generally followed by perſpiration; and this commonly happens at the ceſſation of the arthritic pain, whether it terminates of its own accord, or is checked by an opiate. This diminution of the fluids prevents the pain from returning; for the redundancy, which was the immediate cauſe of the paroxyſm, is carried off.

The ſeparating arteries which produce the paroxyſm are however left, by the uſe of opiates, in a partially deſtroyed ſtate. But there appear to be ſome exceptions to this rule; for I have ſeen an inſtance of a ſwelling coming on

after violent arthritic pains, which had been relieved by opiates. This was imputed to the deſtruction of the artery which the increaſed force of the heart had effected during ſleep. An opiate was adminiſtered in another paroxyſm of the gout. It ſoon quieted the pains, and brought on ſleep. The ſleep was accompanied with conſiderable perſpiration; but no tumour appeared, the day following, on the part where the pain was ſeated in the preceding evening. The arteries were, therefore, left in a ſtate of incomplete deſtruction. Another opiate was taken in the ſecond night, to keep up the perſpiration, and prevent the ſeparation from beginning again. The perſpiration was accordingly ſufficiently copious, for the perſon had no return of the paroxyſm.

Opiates were given in a third caſe, where the pain was intolerable. The moment the pain abated, perſpiration commenced. It was, however, only gentle, and eaſily checked. The pains accordingly returned in the evening of the following night, but were quieted by the repetition of the opiate. The perſpiration was,

in conſequence of the ſecond doſe, more copious; but as the pains again appeared in the third evening, the opiate was again adminiſtered, the perſpiration was more copious than it had been in the two preceding nights, and more eaſily kept up, through the following day, by frequent draughts of warm Madeira whey. As the pains did not return on the fourth evening, the opiate was diſcontinued; but the patient had a natural ſleep without it.

The skin being ſtill moiſt, that diſpoſition was carefully encouraged by every ſpecies of drink that uſually promotes cutaneous perſpiration, and ſhe kept her bed for a week from the firſt attack; and, during the three laſt days of that period, continued to perſpire. She then ventured to ſit up, and was perfectly recovered.

The ſame perſon, in two weeks, relapſed into another paroxyſm, by being accidentally expoſed to damp air. Opiates were again taken with the ſame ſucceſs; and ſhe has now continued for five months free from the gout.

As opiates give ſuch certain relief in pain, they may be preferred to every other medicine in a very acute paroxyſm of the gout, where the violence of the ſymptoms, when allowed to terminate of their own accord, often makes the joints incapable of performing their natural motions. In theſe caſes no bad conſequences can ever follow the uſe of opiates, becauſe a perſpiration generally ſucceeds more copious when they have been adminiſtered, than when they have not. Whenever opiates are injurious, the skin is obſerved to be hot and dry; and this effect is generally produced when opiates are only given to procure reſt, and not to alleviate pain.

As opiates may be ſafely given in violent early arthritic paroxyſms, where the joints are in danger of being rendered immoveable by the heat of the inflammation, they are evidently highly injurious in more aged gouts, where the pains are languid, and have attacked moſt of the joints of the body; for the nervous fluid, in theſe caſes, has a very ſlow motion, and the frequent

return of pain is the chief means of preſervation. As opiates render that motion ſtill ſlower, they can never be adminiſtered ſafely without ſubjecting the body to palſies, apoplexies, or fevers, upon the ſuppoſition that the incipient ſeparation of an artery will excite a ſhivering, as is ſtrongly ſuggeſted by the manner in which the paroxyſm commences.

Opium, moxa, and oiled ſilk, or any other ſubſtance equally denſe, may be reckoned the moſt efficacious remedies for abating the ſeverity of a paroxyſm of the gout.

The action of the opiates, and the oiled ſilk, is, in ſome meaſure, ſimilar; for they both produce a diminution of the fluids, and leave the ſeparating artery in the ſtate they found it. The oiled ſilk is, however, a much ſafer remedy than the other, and can be continued for a longer time; and although it cannot alleviate the arthritic pain with ſuch expedition as opium, yet, in many caſes, it has the ſame pacific effects. It alſo acts as a drain in aged conſtitutions, by the evacuation it produces. Its utility, in theſe

caſes, has been already experienced; and as opium can never be given in ſuch circumſtances with any kind of ſafety, the ſuperiority of the oiled ſilk is apparent.

As the oiled ſilk is to be preferred to opium in aged gouts, it is alſo to be firſt uſed in every arthritic paroxyſm of the joints. However, as the pain is ſometimes aggravated by it, opium may be then taken to aſſiſt the application; for their united action, in three inſtances, where it was experienced, quickly terminated the fit.

When the operation of the moxa deſtroys the artery which cauſes the pain, it effectually prevents any return to that part. As a fit may poſſibly often be occaſioned by one ſingle artery that may be in a more advanced ſtate of ſeparation than any others in the body, if that artery is deſtroyed, the other coheſions will be enabled to reſiſt the force of the heart for a longer time, and all the bad effects which might proceed from the increaſed power of that organ anticipated. This appears to have been the cauſe of the long interval the clergyman at Batavia en-

joyed after this operation; for, had the paroxyſm been ſuffered to proceed and terminate in the natural way, many of the arteries which excited the pain, might have been left in a half deſtroyed ſtate, and the ſeparation renewed in them the following year. The coheſions in the other joints would have alſo been injured by the duration of the pain of the fit, and their ſeparation ſooner effected for the ſame reaſon.

As the ſeparating arteries are left in a partially deſtroyed ſtate by opiates, and the oiled ſilk only reprieves them from total deſtruction; and as the very ſame arteries are liable to be again ſolicited to ſeparate by any accidental increaſe of the fluids, and ſenſibility of the nerves, or by the force of the contractions of the heart, it muſt be evident that they are both inferior to the operation of moxa, whenever it can be undertaken. But when the pain is deep ſeated, or many arteries appear to be affected, and the patient cannot accurately diſcover their ſituation, it would be in vain to expect the advantages which certainly attend it in leſs complex caſes; and this operation would ſtill be more

uncertain in its effects, where many joints are injured at once, becauſe the prevailing relaxation, manifeſted by the univerſality of the pains, could be little benefited, unleſs all the arteries that excited theſe numerous pains could be deſtroyed. But when the paroxyſm is confined to a ſmall part of the foot, or any ſuperficial part of the body, the operation ought to be inſtantly performed, unleſs there appears a neceſſity for a duration of pain. In ſuch caſes it may be deferred ten or twelve hours.

As a gentle perſpiration is conſtantly obſerved to alleviate the ſeverity of the paroxyſms, ſudorifics may therefore be ranked as the firſt medicines in the gout. It is only from the increaſed cutaneous perſpiration in ſummer, that aged arthritic perſons enjoy theſe happy reſpites from pain in that ſeaſon, which they never experience in a cold or moiſt winter. Theſe gentle exſudations appear chiefly to proceed from the nerves; for they diminiſh their ſenſibility in the ſame manner as ſleep.

Of a very different nature are the profuſe aqueous ſweats that run out of the skin of particular conſtitutions in violent fits of the gout. This ſymptom is attended with great thirſt, ſo that a freſh ſupply of fluid is required. On the contrary, gentle perſpiration removes thirſt, which exiſts before it comes on. By profuſe ſweats the blood is deprived of its thinner and more aqueous parts; ſo that what remains is more denſe and weighty, and is driven againſt the cohering arteries with greater impetuoſity. Pain is therefore obſerved to increaſe, and to rage from profuſe ſweats.

There are many well atteſted ſtories of the good effects produced both by a warm climate and ſudorific medicines.

We read of a certain perſon ſo miſerably afflicted with the gout, in the thirty-firſt year of his age, that he loſt almoſt entirely the uſe of his hands and feet; who, having been obliged, on ſome particular buſineſs to take a voyage to the Eaſt-Indies, in three years afterwards returned to his native country in

good health, cured by the heat of the climate alone, and never afterwards had the leaſt attack. V. Swiet. Com. tranſlat. into Engliſh, Vol. xiii. p. 50.

Count Kinſki, ambaſſador from the Emperor to the treaty at Nimeguen, gave me a recipe of the ſalt of hartſhorn, by which a famous Italian phyſician of the Emperor's had performed mighty cures upon many others, as well as himſelf; and the laſt year upon the Count Montecuculi. The uſe of this I am apt to eſteem, both from the quality given it of provoking ſweat, and of taking away all ſharpneſs from whatever you put it in; which muſt both be of good effect in the cure of the gout. Sir Will. Temple's Works, Vol. i. fol. p. 142. From the nature of the diſeaſe, therefore, it appears, that proper ſudorifics are well calculated to relieve the ſeverity of arthritic pain, and prevent its too frequent returning.

The diet, in this ſtate of the diſeaſe, ſhould be ſpare, and the drinks ſtrongly impregnated with vinous liquors.

If the body is coſtive, and a ſtool urgently required, a clyſter is the ſafeſt way of procuring it; for although the lower inteſtines may be impelled with a putrid colluvies, formed by the heat of the fever, a purge ought ſeldom to be adminiſtred.

The former medicines furniſh us with means to alleviate the ſeverity of the pain in every ſtage of the diſeaſe. Moxa is, however, the moſt eligible. The oiled ſilk may be ſubſtitued when that operation cannot reach the ſeparating arteries, and ought, afterwards, to be uſed in every future return of the diſeaſe; but opium ought never to be joined to it, unleſs the other cannot abate the pain.

All the preceding methods have their particular advantages, in different conſtitutions, in quieting the rage of arithritic pains. None of them, however, are able to check the prevailing relaxation which brings on a paroxyſm of the diſeaſe. I therefore recommend the following method in preference to any other.

Whenever the gouty pain begins in any joint, the joint ſhould be immediately moved. By this, the fluids are driven back from the ſeparating arteries which they were urging to deſtruction, and the tenſion is taken off the nerves. The pain, therefore, ſoon abates, and the part recovers its uſual powers. If the pain returns, upon the diſcontinuation of motion, the motion ſhould be renewed, and perſevered in; and the part will be, at laſt, ſo ſtrengthened as to be in no danger of a relapſe. Flannels are here never to be uſed; for the part ſhould be clothed with its ordinary covering.

Two fits of the gout were treated in the former manner, when the pain was in the great toe. The inflammation appeared, however, in both to be at its height, and attempts to motion were ſuppoſed impracticable. Having aſſured the patient, however, of the cauſe of arthritic pain, and of the injury the part would ſuſtain by a continuance of the inflammation, the foot was boldly ſet upon the ground, and moved with

reſolution. The pains inſtantly abated, and a facility in the motion of the part recovered.

From the nature of the diſeaſe, walking now appears to be the moſt rational way of treating the gout, when the pain is in the lower extremities. There are many living witneſſes who have experienced this fact, and walked off a fit of the gout. When the pain is in the hands, elbows, or ſhoulders, motion muſt be diſtributed to them by other kinds of exerciſe. If the pain be ſeated in any part which partakes of little motion, frictions may then be ſubſtituted for exerciſe.

The Rhyngrave, who was killed laſt ſummer before Maeſtricht, told me, his father, the old Rhyngrave, whom I knew very well, had been long ſubject to the gout, and never uſed other method or remedy, than upon the very firſt fit he felt, to go out immediately and walk, whatever the weather was, and as long as he was able to ſtand, and preſſing ſtill moſt upon the foot that threatened him; when he came home he went to a warm bed, and was rubbed

very well, and chiefly upon the place where the pain began. If it continued, or returned next day, he repeated the ſame courſe, and was never laid up with it; and, before his death, recommended this courſe to his ſon, if he ſhould fall into that accident.

A Dutchman, who had long been in the Eaſt-Indies, told me, in one part of them, where he had lived ſome time, the general remedy of all that were ſubject to the gout, was rubbing with hands; and that whoever had ſlaves enough to do that conſtantly every day, and relieve one another by turns, till the motion raiſed a violent heat about the joints where it was chiefly uſed, was never troubled much, or laid up by that diſeaſe. Sir Will. Temple's Works, V. i. fol. p. 143.

My youngeſt brother told me he had a keeper very ſubject to it, but that it never laid him up; but he was ſtill walking after his deer or his ſtud while he had the fits upon him, as at other times, and often from morning to night, though in pain all the while. This he gave me as one inſtance, that poor

and toiling men have ſometimes the gout, and that many more may have it than his keeper, who yet, he confeſſed, uſed to bring the fits upon him by fits of drinking, which, no doubt, is a receipt that will hardly fail, if men grow old in the cuſtom. Sir W. Temple's Works, V. i. fol. p. 143.

CHAPTER XXI.

WHENEVER the pain of the fit is ſo much abated, as not to be felt when the limb is at reſt, the perſon ſhould be then ſet on horſeback, and carried out every day. By this exerciſe he will ſooner recover the uſe of his hands and elbows, than by waiting at home for the return of the ſtrength of theſe joints; for they all enjoy ſome action by the motion of the animal. If the paroxyſm was in the lower extremities, riding will be of little benefit to them, for they receive leſs action on horſeback than any of the joints of the body. Riding evidently ſtrengthens all the vital organs; for it quickens the reſpirations, and conſequently exerciſes the lungs, ſtomach, liver, ſpleen, inteſtines, bladder; and, in ſhort, all the viſcera of the abdomen. Theſe organs are not only more quickly agitated by the increaſed reſpirations, but they enjoy another motion in common with

the extremities, and ſuperficial parts of the body.

Now, the feet have nearly as little exerciſe on horſeback, as when the body is in perfect reſt. They have only that kind of tremulous motion we have juſt taken notice of, and which is ſo very inconſiderable, when compared to the great action of progreſſion, that it does not merit the ſmalleſt attention. They will even be found to be injured by this exerciſe; for the weight of the blood, between the feet and the heart, is not only continually preſſing upon the coheſions in the feet, as it always does when the body is perpendicular, but this weight is alſo conſiderably augmented by the force of the concuſſion from the ſteps of the animal, which bears down upon the coheſions, according to the greater or leſs motion the animal excites.

As riding ſtrengthens the vital organs, ſo it neceſſarily produces ſtronger and fuller contractions in the heart. Hence it impels the blood againſt the cohering arteries of the extremities with greater force.

The ſtomach, indeed, is enabled to perform more copious digeſtions ; but this only tends to increaſe the ſize of the body, and furniſh too abundant ſupplies of fluids to the parts which are already in a great ſtate of relaxation ; ſo that a cohering artery in the foot is approaching to the point of ſeparation, even while the body is moſt in health. Riding, therefore, only ſtrengthens one half the body, by which means the other is expoſed to greater injury.

No circumſtance has been leſs noticed than this ; and it is evident none requires a more particular attention. Every part of a healthy body gives a proper reſiſtance to the powers of the heart, and cannot be injured by the momentum of the blood. But the caſe is different in an arthritic conſtitution. Many parts of the body are here weaker than others, and are therefore liable to be injured by the leaſt increaſe of the powers of the heart. For this reaſon theſe powers ought not to be increaſed, unleſs the weak joints are at the ſame time ſtrengthened by proper motions. If the parts of voluntary

motion are exerted, the powers of the vital organs are neceſſarily increaſed; on the contrary, the powers of the vital organs may be increaſed, when the parts of voluntary motion can receive little benefit.

Many fatal conſequences may follow an improper attention to this inequality of reſiſtance in the various parts of a relaxed habit. As riding, therefore, chiefly benefits thoſe parts of the body which are moſt in action, ſo it ſhould only be uſed when ſuch parts are diſeaſed. For this reaſon, when the arms have been attacked in the paroxyſm, they will receive great relief from this exerciſe. I know a gentleman who always rides a hard trot whenever he feels the gout coming into his hand, and never fails from preventing its continuing.

When the gout has been in the knees, ankles, or feet, the perſon ſhould be for ever attempting to move theſe parts; for he will much ſooner recover their mobility by theſe, than by any other means. He will prevent the con-

traction or ſhortneſs of the muſcles; an inconvenience which is apt to remain, when the attacks of this diſeaſe have been in the muſcles. He will likewiſe promote the abſorption of the fluids which produce the ſwelling; and, by carrying them off, will anticipate the relaxation of the fibres immerſed in them.

We ſuppoſe, that the firſt attempts to motion are attended with conſiderable pain; but they will ſoon become more eaſy, if perſevered in. The patient muſt, however, be very careful not to overact his part; for the veſſels are ſo diſtended by inflammation, and their nerves ſo irritable, as to make the joint very liable to another paroxyſm.

If the difficulty and pain, however, increaſe very much after motion, it ſhould be intermitted, or, at leaſt, be uſed with greater caution. If the patient is obliged to interrupt his motion, he ſhould renew it in a few hours afterwards, or the following day; for by perſevering in gentle

attempts of this kind, to recover the uſe of the part, he will certainly at laſt ſucceed.

Purges ſhould never be given in this ſtage of the diſeaſe. The ſtimulus which they give the nerves increaſes their ſenſibility, and the powers of the heart. They therefore ſubject the patient to a relapſe, as many arteries are frequently left in a partially ſeparated ſtate at the end of a paroxyſm. I once brought on an accident of this kind from preſcribing a very gentle purge when the patient had ſo well recoved as to be nearly able to go out. Sydenham, more than once, made a ſimilar obſervation. *Deinde cathartica in fine paroxyſmi uſurpata, cum morbi reliquias amoliri debuerint, id tantum egere, ut recens paroxyſmus de novo ſuppullularet, haud mitior priori iſto. Quod genus incommodi ipſemet plus ſemel expertus ſum.*

The putrid remains in the ſtomach and inteſtines, at the termination of a fit, being a reſtraint to the powers of the heart, ought therefore not to be carried out of the body too ſoon, till

the parts where the paroxyſm was ſeated have ſo far recovered their tone and reſiſtance, as not to be in danger of being injured by the increaſed momentum of the blood.

As purges are dangerous in the convaleſcent ſtate which follows a fit of the gout, they can never be ſuppoſed to be able to counteract the prevailing relaxation, which is the original cauſe of the diſeaſe.

Bitter and ſtomachic medicines invigorate the powers of the heart, and increaſe the action of the arteries. The bark, and the Portland powder, are therefore to be uſed with caution, as they will eaſily bring on a relapſe in this ſtage of the diſeaſe. The blood may alſo be too powerfully driven into the brain, and occaſion paralytic complaints, or form obſtructions in ſome of the ſpontaneous organs.

In the convaleſcent ſtate of the diſeaſe, the diet ſhould be of eaſy digeſtion, and the inclinations

to particular foods always indulged. If any bad conſequences follow theſe gratifications, they ariſe from an exceſs in the quantity, and not in the quality of the food.

CHAPTER XXII.

WHEN once the paroxyſm is happily terminated, the only remaining intention is to endeavour to ſecure the patient from a return; and from what has been ſaid, it will readily appear, which are the moſt effectual methods for anſwering this purpoſe.

As a ſeparation of arteries, in a cohering ſtate, is the immediate cauſe of the fit, the chief intention for preventing a return of the arthritic pain, will be to preſerve the arteries in a ſtate of coheſion.

The cohering arteries are beſt maintained in a ſtate of coheſion, by a daily repetition of the ſame exerciſe which reduced them to that ſtate.

The arteries are firſt made impermeable by the innumerable flexions and extentions which the

joints are compelled to perform in the gymnaſtic exerciſes of youth.

From the time children firſt walk, they begin to enjoy theſe exerciſes, and their activity is amazing. They perform more numerous exertions of their muſcles in an hour's play, than many laborious men appear to do in a whole day's work. They are even uneaſy if obliged to ſit, for motion relieves them from pains of their joints they are otherwiſe expoſed to. Theſe pains ſeem to proceed from the ſeparation of thoſe arteries their former day's excerciſe had made to cohere, and which cannot be effected without exciting diſagreeable ſenſations.

As walking, running, leaping, wreſtling, and every laborious exertion of the muſcles, is continually bringing on coheſions of the arteries of young people, a repetiton of theſe exerciſes is evidently the beſt means of preſerving the arteries in a cohering ſtate.

An uniform motion, diſtributed as equally as poſſible among the various parts of the body, is

the great preſervative of health. Nothing can, therefore, ſo certainly lay a foundation for perpetual fits of the gout, as great exerciſe ſuddenly diſcontinued; for arteries are only compreſſed by exerciſe, and the more violent that is, greater numbers of them will neceſſarily be brought to cohere.

If a perſon takes violent exerciſe for two or three days in a month, and imagines, by that, to counteract all the bad effects of the ſedentary life he may have led during the reſt of the month, he will be much miſtaken; for the relaxed ſtate, to which his body is reduced by the inactive and ſtudious part of his life, ſubjects his arteries to be more eaſily cloſed; ſo that a greater number of them will be rendered impervious by this ſudden change of life.

If a greater number are cloſed, a greater number will afterwards be diſpoſed to open, and of conſequence his early arthritic paroxyſms be violent, and his aged ones be protracted. Had this perſon, therefore, keeped his ſeat, and gone on in the ſame manner he had ſpent the inactive

part of the month, no coheſions could have been effected, and he would have lived exempt from the diſeaſe.

We formerly obſerved, that the feet were firſt ſubject to the gout, becauſe they were more readily affected by a diſcontinuance of exerciſe than any other part of the body. When other joints, however, have been more exerciſed than the feet, arteries of greater diameter will be brought to cohere in them, than in the feet; and they will be ſooner affected, by the relaxation which comes on, when the ceſſation from exerciſe takes place.

A lady ſpent the younger part of her life in a nunnery, and there ſhe led a very ſedentary life. She was, however, conſtantly employed in working with the needle, by which means her arms were the only extremities that enjoyed any conſiderable motion. At eighteen ſhe changed this way of life, and went to the Weſt-Indies, where ſhe ſewed no more, but led a life of great indolence. At twenty-two ſhe had a ſevere fit of the gout in her right ſhoulder.

From that time ſhe had almoſt perpetual fits in the joints of her collar bone, and in her elbows, wriſts, and fingers; and, till ſhe returned to England, had never one fit in either her feet or knees. Being, however, confined to her room and bed for almoſt a year, by a tedious paroxyſm, upon her arrival in this country, ſhe at laſt had a fit in her feet; and, ſince that time, her pains ſometimes prevail in every joint of the body. This lady is at preſent about thirty-two years of age, her gout hereditary, and her head uncommonly large.

The very inactive life ſhe led in the nunnery brought few arteries in her feet to coheſion: ſuch as were brought to cohere, were for that reaſon ſmall, and eaſily maintained in a ſtate of coheſion, by the preſſure of her ſhoe, and the weight of the extremitities. When this preſſure, however, was at laſt diſcontinued, by the horozontal poſition to which ſhe was ſo long confined, the cohering arteries of the feet alſo ſeparated.

At the ſame time, therefore, that this confirms the opinion, that the gout firſt begins in

the parts of the body which are more compreſſed or moved, when the cauſes of relaxation prevail, it alſo demonſtrates the abſolute neceſſity of perſevering in particular exerciſes.

Although perſeverance, in general and particular exerciſes, is apparently the only method of preventing an attack of the gout, yet it may be objected to our ſyſtem, that there are inſtances of people, who walk much, being afflicted with the diſeaſe in their feet. Exceptions of this kind are eaſily accounted for. They either proceed from extraordinary irregularities in the way of living, or great hereditary relaxation.

Some perſons take conſiderable exerciſe, but counteract all the good effects of it by hard drinking, luxurious diet, immoderate venery, &c. They are active a few hours of the day, and waſte the remaining part of it in indolence. Their activity, in this caſe, only delays the progreſs of the relaxation, and keeps off the paroxyſm for a ſhort time, but is totally inſufficient to prevent it. A propenſity to inaction is the unavoid-

able conſequence of a full diet, and action is never ſo neceſſary as after a luxurious meal. People who indulge their appetites may therefore take much exerciſe, but they ſtill cannot take enough; for their diet is of ſuch a nature as to diſqualify them from counteracting its bad effects.

In this caſe the relaxation of the ſolids being only acquired, the exceſſes which were the cauſe of it ſhould be diſcontinued, and the uſual exerciſe will then be ſufficient to prevent a return of the diſeaſe. If the exceſſes are only diminiſhed, the exerciſes ſhould be increaſed, for nothing is more evident, than that exerciſes ſhould be proportioned to the peculiar cauſes of relaxation.

There may be other people who walk much, and yet have the gout in the feet; becauſe their ſolids are naturally ſo relaxed, as to bring on a ſeparation in the cohering arteries, upon a few weeks neglect of their uſual exerciſe. This may likewiſe happen when they walk more than or-

dinary ; for the arteries, which the extreme exercise of the day had shut up, begin to open in the night by the heat of the bed, and the strong contractions of the heart.

In this case, where the relaxation of the solids is supposed to be natural, a more constant and uniform exercise is necessary to maintain the arteries in their cohering state. Greater temperance is also necessary for such persons, than for others of firmer fibres ; for the same foods, that the one may receive with impunity, will unavoidably increase the morbid dispositon of the other.

Laborious people, who live upon the spareſt diet, may also have the gout, when their usual exercise has been of such a nature as to bring arteries of large diameters to a state of cohesion. Hence it has been observed, that *such as get their living in Holland, by digging of turf, are often obliged to stand the whole day with their feet under water ; it is the same with fishermen ; and though they wear boots, yet these being insufficient to keep out the wet, it is their custom many times to dry*

them by ſitting near the fire, whence the ſolid parts become rigid; and even the boots, unleſs immediately done over with oil, are rendered for ever uſeleſs. Hunters, too, who, regardleſs of every kind of weather, are ſometimes obliged, in purſuit of their ſport, to remain long in marſhy places, with their feet immerſed in mud and water, bring on that ſame noxious diſpoſition; and, by rendering the ligaments and tendons ſtiff and rigid, fall often a prey to this diſtemper. V. Swiet. Com. Vol. xiii. p. 26. tranſlated into Engliſh.

We have ſeen, that many perſons, who take great exerciſe, may yet be ſubject to the gout; and it is equally certain, that others, who take but little, may be for ever exempt from it: for an indolent life is not likely to bring about coheſions in many of the arteries. To this may be added, that ſuch a kind of life is more uniform in thoſe few exerciſes which cannot be avoided.

Aged arthritic perſons, who have very weak joints, muſt not imagine, that their unhappy ſituation deprives them of every chance of advantage from this method of cure; for, if the uſe of the joints is

not totally loſt, it may be much recovered by frequent attempts to motion; by theſe the flexions of the joints will not only be made eaſier by motion, but the cohering arteries ſtrengthened and maintained, and of conſequence the joint will be exempt from the continual pains which affected it.

Although theſe little motions are languid and feeble, and much inferior to the juvenile vigorous exertions of the muſcles, which brought the arteries to a ſtate of coheſion, and can be ſuppoſed to have no ſuch effect upon the arteries which are open at that time of life, yet it is evident, that a leſs degree of motion will be ſufficient to preſerve an artery in a ſtate of coheſion, than to bring a coheſion in any other pervious artery. If an artery, for inſtance, is compreſſed in a joint of the great toe, by walking fifteen miles a day for any given time, this veſſel may poſſibly be preſerved in its compreſſed ſtate by walking five miles every day. If another perſon has been accuſtomed to walk thirty miles in the day, and afterwards only walks five, he may be ſubject to the gout: for he evidently devi-

ates too far from his former way of living; and the greater the deviation, the more he is liable to the diſeaſe. Hence the reaſon why the gout falls moſt ſeverely on indolent perſons, who have ſpent the early part of life in the greateſt activity.

An imitation of the exerciſes of youth is, therefore, only required to keep the arteries in the joints of an aged arthritic perſon in a ſtate of coheſion. He may attempt to walk, and this will ſtrengthen his lower extremities. If he bends his arms and fingers frequently, his elbows, ſhoulders, &c. will be leſs ſubject to relapſe. He ought alſo to be employed in exerciſes which require the exertion of all the voluntary muſcles; for an exerciſe of one part of the body only ſtrengthens the part which is exerciſed. All theſe endeavours to motion ſhould be aſſiſted with iſſues.

Iſſues have frequently been obſerved to protract the intervals between arthritic paroxyſms; and it is now evident in what manner this was effected: for, as the nerves of gouty people are

in ſuch a ſtate of inordinate relaxation, and the nervous fluid moves ſo ſlow in them, every ſtimulus, which accelerates the motion of the fluid, muſt counteract the morbid ſtate of the nerves.

Iſſues, however, not only accelerate the motion of the nervous fluid in the nerves of the whole body, but ſometimes evacuate a conſiderable quantity of it at the orifice of the iſſue. This evacuation or diſcharge is generally greateſt immediately before and during a paroxyſm; for then the fluids are in greateſt quantity.

Iſſues are never ſo beneficial as when they excite moſt pain, and the body never ſo healthy, and exempt from the gout, as at that time. It is therefore erroneous to imagine, that the benefit they procure to a gouty conſtitution proceeds from the evacution alone they produce; for a man of gouty conſtitution is frequently in beſt health when his iſſues are dryeſt, and moſt painful. They are therefore beneficial, by the general irritation the nerves receive from them, and ought to be changed from one part of the body to another, every three or

four months, otherwiſe the extremities of the nerves of the wound will grow callous and inſenſible, and the body be deprived of the advantages of the irritation.

As the relaxation of an aged gouty conſtitution prevails in many of the vital organs, Bath waters, warm ſtomachic, and laxative medicines, cautiouſly adminiſtered, will be of ſingular ſervice in reſtoring their functions. Riding will be alſo of the greateſt advantage in anſwering this intention, but care ſhould be taken not to induce fatigue by this exerciſe, that the perſon may be enabled to walk for ſome time on the ſame day that he rides. Theſe two exerciſes he ſhould always uſe alternately, and be very cautious in proportioning them to his ſtrength, leſt the, nerves in the cohering arteries, ſhould be ſo far increaſed in ſenſibility, by fatigue, as to bring on a fit in ſome of the extremities. At the ſame time, the urinary ſecretions may be increaſed by ſaponaceous alkaline medicines, which ſo powerfully carries off the redundancy of fluids in ſome conſtitutions, as to protract the interval of the fits.

The facility in curing the gout will depend on the ſtate of the joints; for, the weaker or more ſtiff they are, the perſon will be leſs able to perform theſe exerciſes, which are the only means of anſwering this intention. Aged gouty perſons muſt not therefore be diſcouraged at the frequent tendencies to pain, which they may experience when they firſt renew, or rather imitate the exerciſes of their youth. From the nature of the diſeaſe, ſuch ſenſations muſt neceſſarily be excited at firſt, and afterwards taken off by a repetition of the ſame motions which brought them on. When the patient is ſo fortunate as to keep off his uſual pains by theſe endeavours, he muſt ſtill perſevere in exerciſe; for there can be no other poſſible ſecurity to prevent a relapſe. If he reſolves upon this, he may then be aſſured, that he ſtands a better chance for a long life, than if he had never had the diſeaſe.

The following is one of many inſtances, to be found in medical writers, of the benefits which arthritic conſtitutions have received by being reduced to a neceſſity of giving their joints their

natural motions. *A certain prieſt, who enjoyed a rich living, and had been an old conſtant ſufferer in the gout, happening at laſt to be taken by the pirates of Barbary, was detained there, for the ſpace of two years, a ſlave, and kept conſtantly at work in their galleys; which had this good effect, that, afterwards, when he was ranſomed from captivity, having loſt all his troubleſome and monſtrous fatneſs, he never once had a fit, though he lived ſeveral years after the event.* V. Swiet. Com. tranſlated into Engliſh. V. xiii, p. 17.

It will now readily appear, that many arthritic perſons may bring on, or keep off, the gout, juſt as they pleaſe. For ſake of illuſtration then, let us ſuppoſe all the fingers to be bent five hundred times in the day, for five years; and let us farther ſuppoſe, that theſe contractions are intermitted in two of theſe fingers for ſome time after, while they are continued in the others; the fingers, which have been ſuffered to relax from their former exerciſe, will be ſubject to the gout, and the others will neceſſarily be exempt from it. The gout may be ſooner brought on any of theſe fingers, by relaxing them with

warm water, &c. for the only certain method to bring the gout upon a joint that once ſuffered great action, is to weaken it.

Nothing, therefore, has ſo ſalutary an effect on the veſſels of the joints, as gymnaſtic exerciſe. We have the concurrent teſtimony of all ages to ſupport this aſſertion. The greateſt number of the laborious part of mankind have been for ever exempted from the diſeaſe. The ſame exertion of the muſcles, which made the veſſels to cohere in one day, not only retains their coheſion by being repeated the following day, but even increaſes it. By this the veſſels are continually growing leſs and leſs numerous, and the bodies of theſe people conſequently more and more rigid. It is impoſſible, therefore, that relaxation can prevail ſo far, in ſuch a way of life, as to ſubject a cohering artery in the joints to ſeparate.

Nothing is therefore more eaſy, than to reconcile the ſeeming contradicting ſymptoms of the gout to each other. The diſeaſe itſelf is uniform, and always proceeds from a ſeparation

of cohering arteries. This ſeparation is the effect of relaxation in their coats, which may proceed from innumerable cauſes. One perſon may bring on relaxation by over eating, another by exceſs in drinking, a third by inordinate venery, a fourth by too intenſe application of the mind, a fifth by diſcontinuance of uſual exerciſe, &c. As the gout may be produced by ſuch a variety of cauſes, which may all act differently on different conſtitutions, it would be to no purpoſe to lay down general cautions to avoid particular irregularities.

As many conſtitutions have peculiar attachments and averſions to different foods, it might be uſeleſs, or dangerous, to preſcribe rules of diet. Every gouty perſon is ſufficiently informed, by his own obſervation, what foods beſt agree with him; and theſe he ſhould live upon. There is no occaſion to do penance, through life, to preſerve the body from the gout; for, if the the exerciſe is proportioned to the quantity and quality of meat and drink, the cohering arteries will not be diſpoſed to ſeparate.

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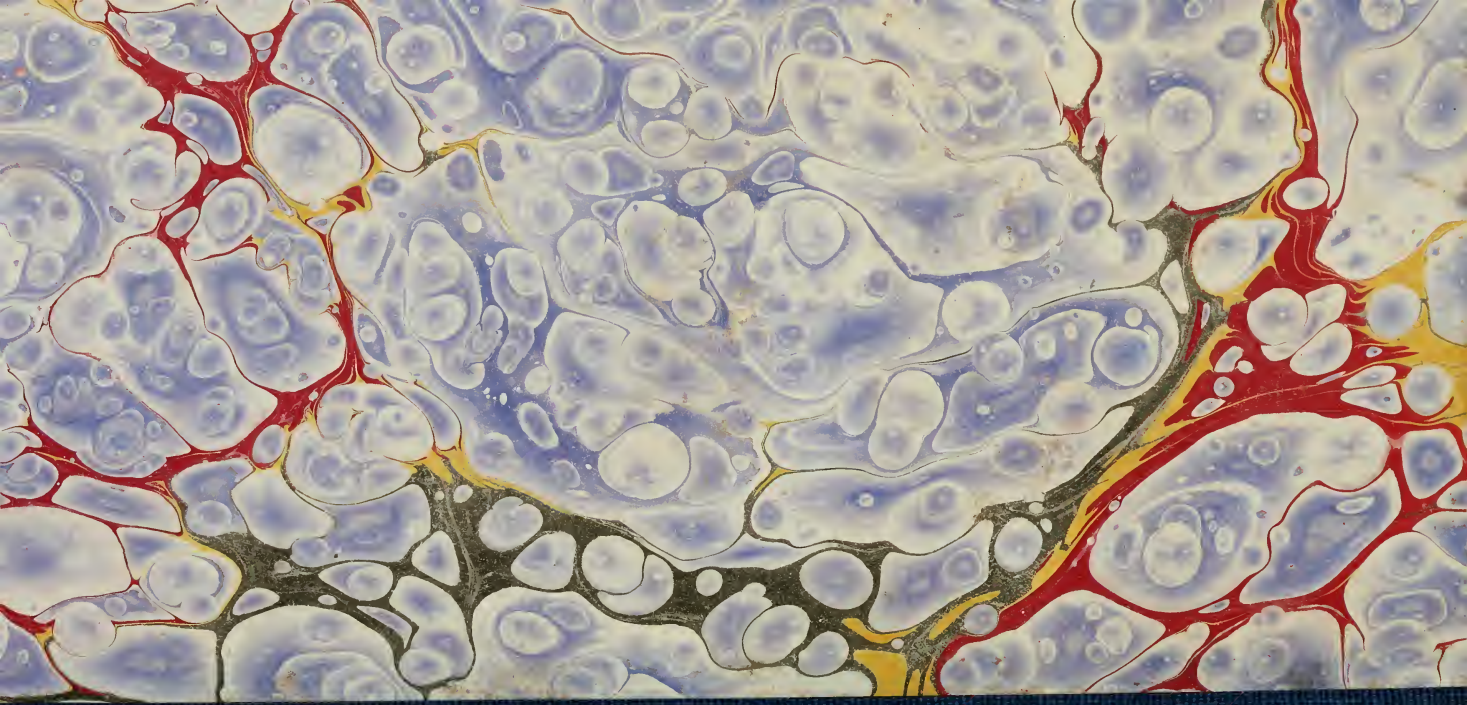
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